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MAGAZINE OF BOTANY.

PAXTON'S

MAGAZINE OF BOTANY,

AND

REGISTER OF FLOWERING PLANTS.

"Flowers of all hue."

VOLUME THE ELEVENTH.

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TO

HIS IMPERIAL MAJESTY,

THE EMPEROR OF RUSSIA,

ETC. ETC. ETC.

SIRE,

Having been honoured by a condescending permission, I presume to dedicate to Your Imperial Majesty this ELEVENTH VOLUME OF THE MAGAZINE OF BOTANY; on account of the work being devoted to pursuits on which Your Imperial Majesty has bestowed such liberal encouragement, and because it also contains an account of a Fountain which I have lately constructed at Chatsworth, by the Duke of Devonshire's direction. As this Fountain is the highest in the world, I had ventured humbly to share the hope which he fondly cherished, that its column of water would have first gushed forth when Your Imperial Majesty set foot on the sward of Chatsworth. The compensation he has found is, in bidding it bear the name of "The Emperor."

I have the honour to be,

Sire,

Your Imperial Majesty's

Most obedient, humble Servant,

JOSEPH PAXTON.

Chatsworth,
December 14*th*, 1844.

ADVERTISEMENT.

The wane of another year, and the last page of another volume, necessarily bring the Editor and his readers into a kind of personal contact; in which, though the utterance of any sentiment proceeds from the one side alone, the object in view is to cement yet more firmly their mutual good understanding.

We assume thus advisedly that a reciprocal friendliness of feeling has not now to be sought after, but is already well established, and only needs duly maintaining; because eleven years of Editorial experience have given us the fullest proof that our contributions to this class of periodical literature have been most favourably regarded. There cannot be a doubt that a work of this nature has a firm hold on the public mind, when its sale is kept up to so high a standard during such a number of years, and has even very recently been augmented. Such a state of things is, indeed, in the highest degree flattering.

But while we look with considerable pleasure on these substantial tokens of approval, we wish them to have their legitimate influence, and to give a new impulse to our endeavours, instead of at all repressing our zeal. The right use of encouragement is to spur the aspirant onward, and not to lull into carelessness. And we hope to go on demonstrating that our gratitude is too deep and abiding to permit us to fall into the latter error.

Our pictorial department has now happily reached a position which simply requires to be maintained. Its excellence is so universally acknowledged, that it needs no demonstrating. And in regard to its future style, while we retain the same machinery, we have also secured a stock of drawings, which for the beauty of the plants pictured and the elegance of their delineation, are quite equal to those in any former Volume.

In the preparation of our readable matter, we are favoured with sufficient assistance to keep it varied, so as to embrace both the scientific and the practical ; and, likewise, we secure the customary supply of intelligence respecting novel plants, the metropolitan progress in culture, and all the current improvements that are of real value.

Many of our Subscribers would no doubt be gratified by the representation and description of the large Fountain at Chatsworth. We shall follow up the practice of introducing these novelties whenever the opportunity is experienced.

The thanks we owe to our numerous kind supporters, and which are not less genuine because they have been so frequently offered, are now most cordially renewed.

CHATSWORTH,
December 20, 1844.

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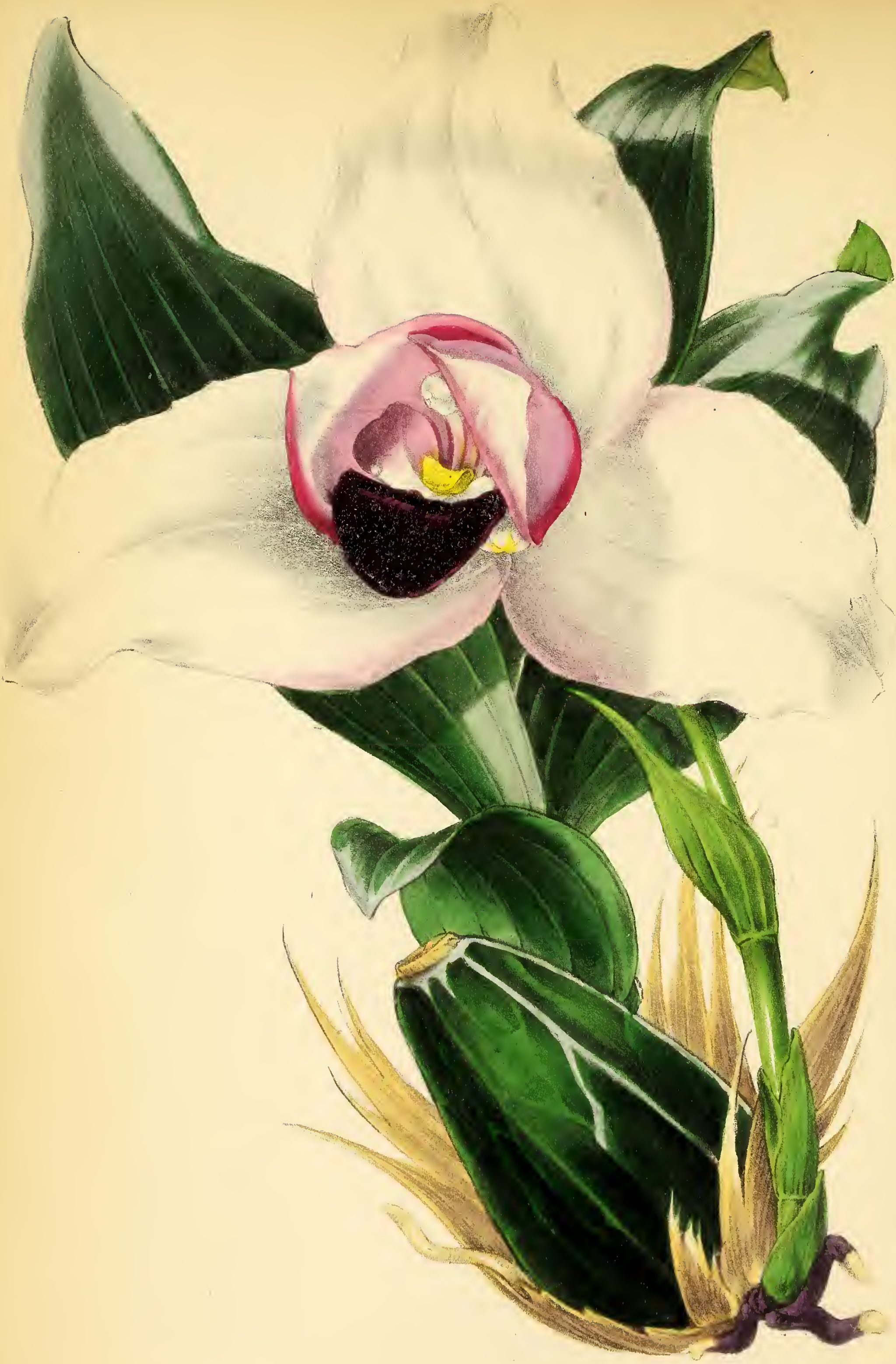

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Lycaste Skinneri.

LYCÁSTE SKÍNNERI.

(Mr. Skinner's Lycaste.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDÀCEÆ.

Generic Character.—*Flowers* ringent; petals often dissimilar, prolonged into a short, chin-like projection. *Labellum* with a transverse fleshy appendage in the middle, entire or emarginate. *Column* elongated, semicylindrical, often hairy. *Pollen-masses* four, adnate to a narrow elongated caudicula; gland small, roundish; beak awl-shaped.

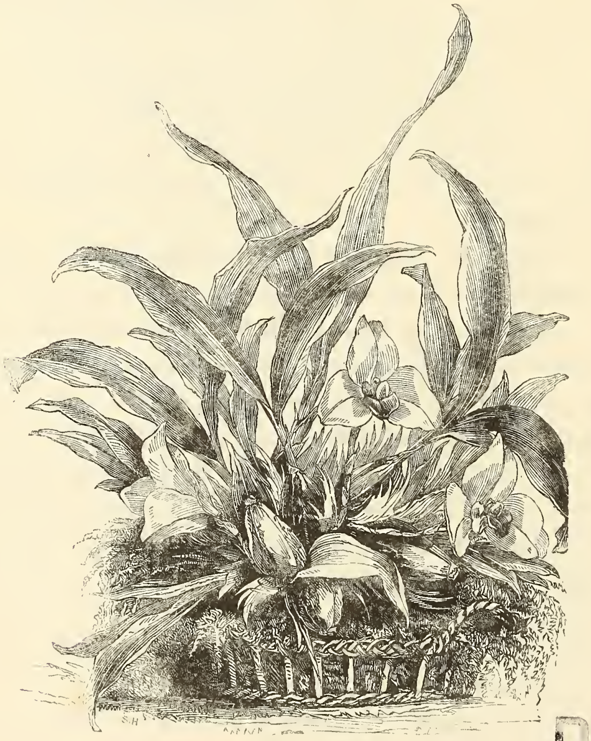
Specific Character.—*Plant* an epiphyte. *Pseudobulbs* roundish, ovate, three-leaved. *Leaves* lanceolate, acute, plaited. *Scape* loose, sheathed, ascending. *Bracts* herbaceous, acute, cucullate. *Sepals* spreading, oblong-lanceolate, acute. *Petals* only half the length of the sepals, oval, erect, folding above the column, reflexed at the summit. *Labellum* three-lobed; lateral lobes erect, truncate, middle one larger, ovately-roundish, deflexed; with a fleshy, tongue-shaped appendage situated between the lateral lobes. *Column* pubescent beneath.

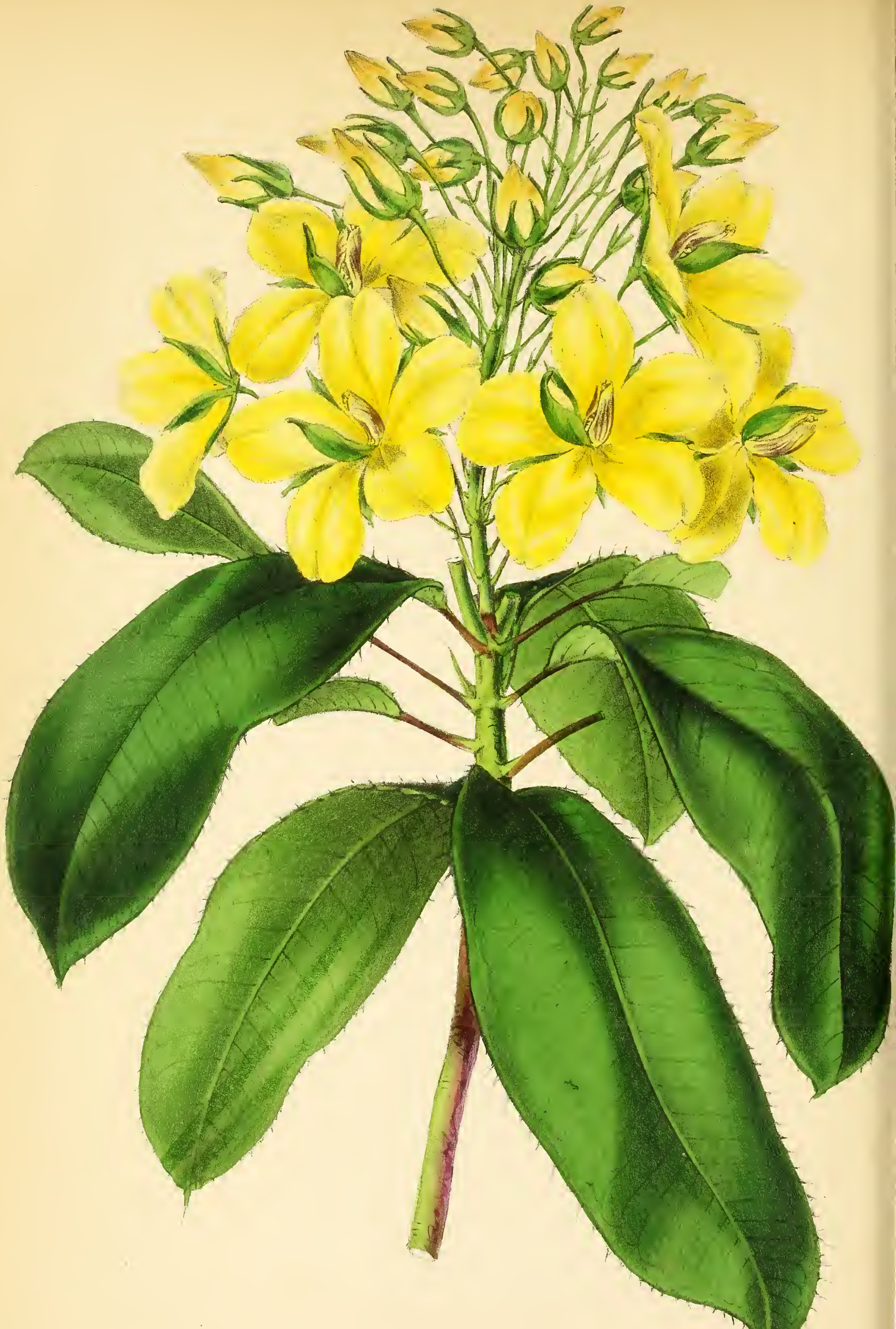
Lycaste is the name of a new genus, which has been separated from the old group *Maxillaria*, and includes the well-known and delightful *M. aromatica*, with *M. macrophylla*, *M. cruenta*, and several others. The plant before us is, indeed, generally called *Maxillaria Skinneri;* but it is now classed by Dr. Lindley among the species of *Lycaste.*

L. Skinneri is happily designated by Mr. Bateman as the *facile princeps* of all known Maxillarias. " It has at length," says that gentleman, writing in the Miscellany of the Botanical Register for 1842, " flowered in the collection of the Rev. John Clowes, with a vigour and beauty that could not be exceeded in its native haunts. The flowers actually measure upwards of six inches across, from the tips of the lateral sepals, while the latter are nearly an inch and a half wide in the broadest part. The colours of the flowers are peculiarly delicate, the sepals being pure white, faintly tinged with crimson at the base;—the petals of a more rosy hue, while the tip is almost covered with spots and streaks of the most brilliant carmine. The column, again, is pure white at the apex, and mottled with crimson spots at the base; while a number of woolly hairs are scattered on its under side. The habit of the plant is stately, and its growth free and vigorous, more nearly resembling *Lycaste Deppii*, than any other species."

To this good description it is unnecessary to add more, than that there appears to be two or three varieties of the plant, differing slightly in the size and colouring of their flowers. The one now depicted, was flowered in the excellent collection of Mrs. Wray, of Oakfield, Cheltenham, and is among the best we have seen. That lady has likewise most kindly favoured us with a sketch of the plant, which is given in the woodcut subjoined. An excellent variety bloomed, moreover, about three months back, with F. Cox, Esq., of Stockwell, whose Orchidaceæ are of the very highest order. Mrs. Wray's plant flowered in November last.

The species has been brought to this country in great numbers by G. U. Skinner, Esq., after whom Mr. Bateman has named it. Its native place is Guatemala; and Mr. Brewster, the gardener to Mrs. Wray, informs us that Mr. Skinner found it growing on rocky and mossy banks, in very moist places. Mr. Brewster, who has been particularly successful in cultivating it, grows it in an open basket, filled with moss and leaf-mould, in a temperature ranging from 50° to 70°. No doubt much of its luxuriance is due to the use of leaf-mould; which, as we have before suggested in this Magazine, is likely to prove a valuable medium for many Orchidaceous plants. It should be kept freely moistened in summer, on account of its vigorous habits; but a cool, dryish atmosphere is indispensable during winter.





S. Holden del. & Lith.

Luxemburgia ciliosa.

LUXEMBÚRGIA CILIÒSA.

(Fringe-leaved Luxemburgia.)

Class.
MONADELPHIA.

Order.
POLYANDRIA.

Natural Order.
VIOLACEÆ.

Generic Character.—*Calyx* with five subequal sepals. *Petals* five, unequal. *Anthers* hypogynous, subsessile, linear, tetragonal at the summit, two-pored. *Style* subulate, incurved. *Ovary* trigonal. *Capsule* three-valved, one-celled, margins introflexed, seed-bearing. *Seeds* marginate.

Specific Character.—*Plant* an evergreen shrub. *Leaves* close on long petioles, oblong-lanceolate, glandularly setose, with a long hairy mucrone at the summit. *Stipules* deciduous. *Corymbs* many-flowered. *Flowers* yellow, polyandrous.

Synonyme.—*Plectanthera ciliosa.*

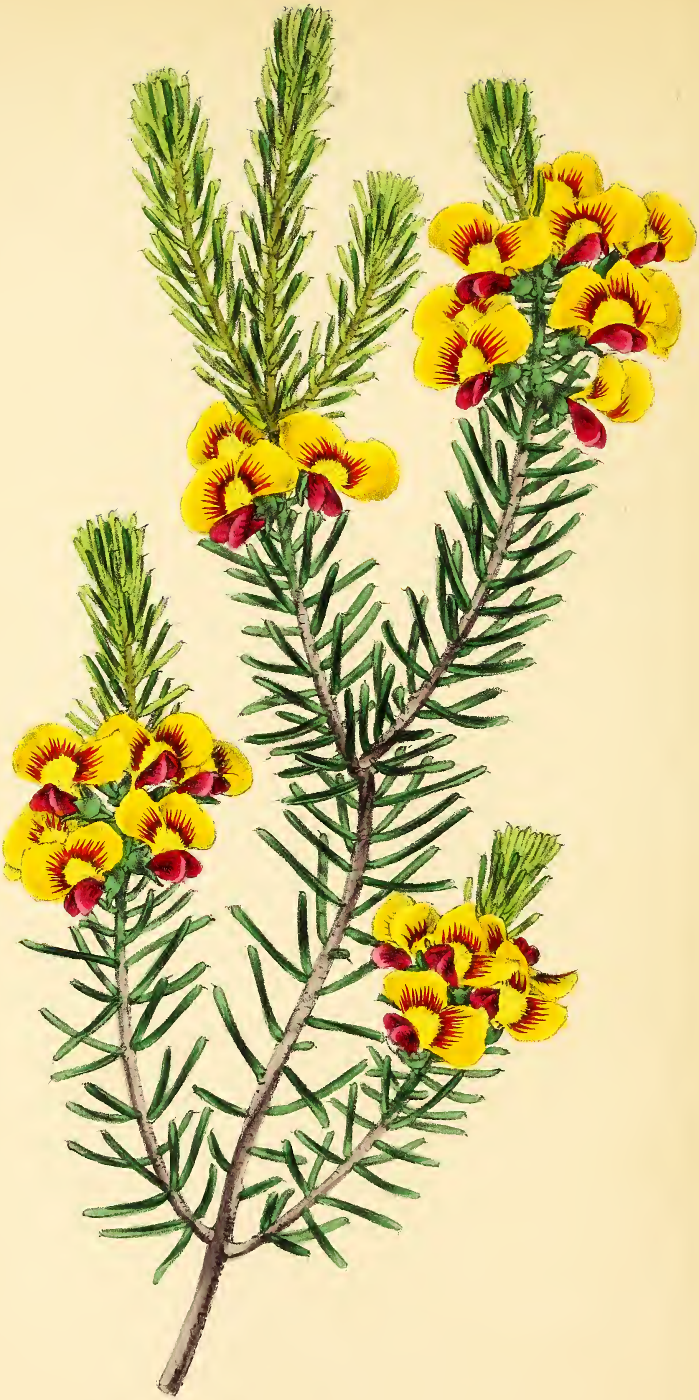
This fine plant forms a very elegant shrub, from two to four feet high; but it is said to attain a height of eight to twelve feet in Brazil, where it also bears branches. "It was first detected," says Sir W. J. Hooker, "by Martius, in the Diamond district, province of Minas Geraes; and, subsequently, in the year 1841, by Mr. Gardner, in moist, peaty soil, in open places, growing with species of *Andromeda*, on the Organ Mountains, at an elevation of 5000 feet above the level of the sea.

The genus was described by M. Auguste de St. Hilaire, under the name of *Luxemburgia*, though other botanists have given it the title of *Plectanthera*. It contains four Brazilian species, known to travellers and botanists; but only the present one is, we presume, introduced to this country.

It has been in British collections about eighteen months or two years, and flowered in several places during the season of 1843. We saw beautiful specimens from the Royal Botanic Gardens, of Kew; from Messrs. Lucombe, Pince, and Co., of Exeter; at the nursery of Mr. Knight, King's-road, Chelsea; and in others of the great nurseries. From Mr. Knight's plant our present drawing was prepared in July of last year. It is through Mr. Gardner that the stock now in England appears to have been obtained.

No plant can be more regular, neat, and pleasing in its mode of growth. There is a very peculiar symmetry, cleanness, and healthiness about it, which seem to attend it in all conditions, and give it a most ornamental appearance. It grows perfectly erect, with a clear stem, and, as we have seen it, to about a foot or eighteen inches in height, without at present having borne any branches. It is well clothed with leaves, from about four or six inches above the soil, and these leaves are long, narrow, very elegant, of the purest green, and delicately cut along the edges into hair-like teeth, which are remarkable for their extreme uniformity. From the top of the stem an upright spike of flowers issues, forming a sort of cone. The flowers are numerous, well-disposed, large, and of a clear lively yellow. They last a considerable time, and are produced abundantly on plants not more than a foot high.

The species requires a stove temperature, and a moist atmosphere, with a rather enriched loamy soil. It would most probably be benefited by a gentle bottom-heat. Were it once to branch in this country, as it may possibly be induced to do by cutting off its summit, its spikes of flowers, proceeding from the extremity of every shoot, will render it one of the very best of our stove plants.



S. Holden. del. & Lith.

Dillwynia clavata.

DILLWÝNIA CLÀVATA.

(Club-shaped Dillwynia.)

Class.
DECANDRIA.

Order.
MONOGYNIA.

Natural Order.
LEGUMINÒSÆ.

Generic Character.—*Calyx* five-cleft, bilabiate, tapering at the base. *Petals* inserted in the middle of the tube of the calyx. *Lamina* of vexillum twice the breadth of the length, two-lobed; lobes spreading. *Ovary* two-seeded. *Style* hooked. *Stigma* capitate. *Legume* ventricose. *Seeds* strophiolate.—*Don's Gard. and Botany.*

Specific Character.—*Plant* an evergreen shrub. *Leaves* numerous, sessile, nearly linear, mucronate. *Flowers* in clusters near the summit of the branches. *Vexillum* very broad, somewhat kidney-shaped, yellow, streaked with red. *Wings* and *keel* reddish-crimson.

Our figure of this pretty greenhouse shrub was made in the conservatory of his Grace the Duke of Devonshire, at Chiswick, Middlesex, where it is well cultivated under the superintendence of Mr. Edmonds, and blooms at several periods of the year, according to the state of the specimens; April, May, and the other months connected with spring, are, however, its usual seasons of flowering.

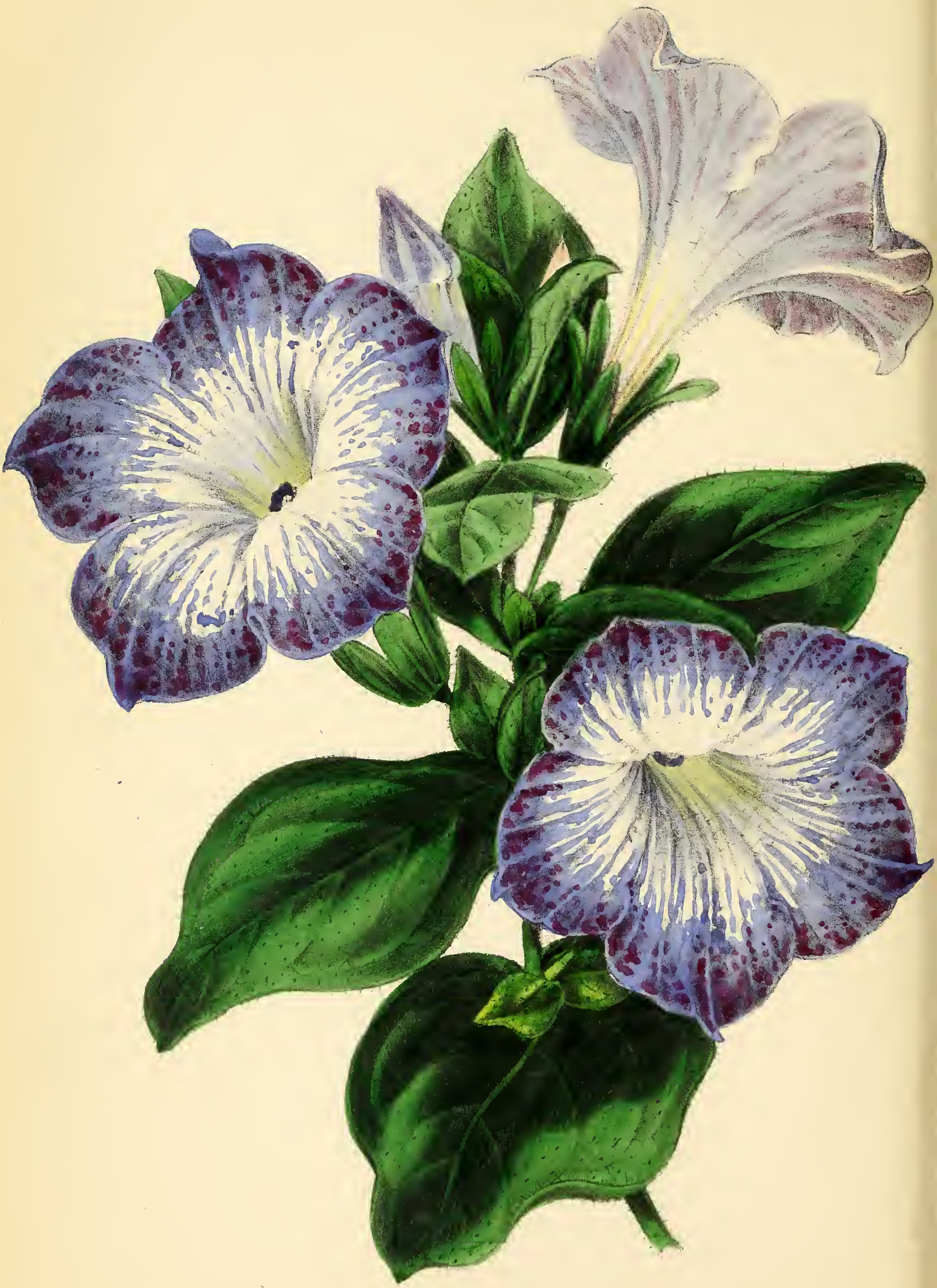
In common with the rest of the genus, it is an Australian plant, and appears to have been derived from the Swan River settlement. We have observed it in the London collections for the last two or three years, and it is abundant in most respectable nurseries.

Although not so gay a plant as some of its allies, or, at least, not so generally producing a profusion of bloom, it is really a superior species when properly managed; its seeming inferiority being due to its disposition to grow straggling when not artificially checked. There is, in fact, a laxness in its manner of growth, which is by no means favourable to its aspect, but which may readily be controlled and altered by the timely use of the simplest expedients. It is a plant calculated to bring practical skill into play; and when it has been subjected to appropriate treatment, it rewards the cultivator most liberally.

Its habitude being stronger, more robust, and less branching than that of most Dillwynias, it requires pruning to keep it dwarf and symmetrical; and, to give this pruning its full influence, it should be done while the shoots are growing, and not in the autumn, winter, or very early spring. It must likewise be began in the earliest stage of the plant's progress, and is to be continued as often as the condition of the specimen may render it needful; that is, so long as any tendency to a rambling character remains.

The soil in which it flourishes best is a very open fibrous heath-mould, mixed with a little porous loam and leaf-soil. The heath-mould should be kept in lumps of nearly an inch square, and be so thrown into the pot as not to lie too closely together. The great bane of all such plants as this, is sifting the compost and using the finer portion, and adding a quantity of sand to even this. The species must not be stinted for pot-room, and should have the ball of roots placed pretty high in the centre of the pot.

It is propagated readily by cuttings of the younger wood, and the spring prunings may usefully be employed for this purpose.



S Holden, del & Lith.

PETÚNIA PUNCTÀTA.

(Spotted-flowered Petunia.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
SOLANÀCEÆ.

A GARDEN PRODUCTION.

Among those charming things which now so liberally grace our flower gardens during the warmer part of the season, and which, at the same time, contribute largely to the adornment of the greenhouse and conservatory, Petunias occupy a distinguished place, in consequence of the freedom of their growth, their copious production of branches, and the prodigality, as well as the extreme showiness of their blooms.

Scarcely any tribe has undergone a more striking improvement in the hands of the hybridist; for, only a few years back, P. *phœnicea* and P. *nyctaginiflora* were the principal sorts cultivated; whereas now, there has been raised, chiefly from these, such an amazing number of beautiful varieties, that they defy all attempts at classifying, or even computing. Some of these are conspicuous for their pleasing tints, and others have enormous flowers. But the best seedling we have yet seen, and which combines in itself large flowers, novel and delightful colours, and an exceedingly compact habit, is that here figured, and which, having got into notice under the name of P. *punctata*, we now publish with that title, although we should have preferred a more popular one. This highly interesting plant was raised by Mr. Miller, of the Providence Nursery, Ramsgate, from seeds of several good sorts, saved in 1842 and sown in 1843. The seedlings, as they flowered, proved so destitute of novelty, that they were generally thrown away. Late in the summer, however, P. *punctata*, and some other good varieties, made their appearance, and were much noticed.

The flowers of this variety exhibit a singular blending of colours. The principal tint is a deep blue, which passes in streaks and blotches into a white centre; the blue itself being likewise mottled with rosy crimson. The latter hue, it seems, gradually dies away, and leaves the flower of mingled blue and white, till it perishes.

Possessing such a freshness of colouring, and being, besides, an intrinsically good sort, it will doubtless become a common favourite in the ensuing season. It is particularly desirable for cultivating in pots, since its peculiarities can be best examined when they are near the eye; and it will be found an admirable plant for decorating balconies or drawing-rooms, for filling stands in conservatories, or for planting in large pots, tubs, or boxes, to occupy any conspicuous situation.

The treatment of Petunias is so commonly known, that we need only remark that *P. punctata* will flourish beneath the ordinary conditions. All the varieties should have the soil in which they are grown somewhat enriched, as they are luxuriant in their habits. The shoots also require frequent stopping in the earlier stages of their progress.

Mr. Miller sends out this plant early in the present spring; and he has, moreover, some seedling Fuchsias and Verbenas, which have much of novelty in them.

GARDENING AS A SCIENCE.

ART. I. VEGETABLE PHYSIOLOGY.

THE utmost extent to which our investigations enable us to attain is very remote from knowledge. Can it then be deemed surprising that very few professional gardeners are acquainted with the structure of the plants they cultivate? When the time of any person is almost entirely occupied in works of manual labour, how is it possible that he shall be able to bend his mind to severe investigation of a dark and mysterious subject? And such is Vegetable Physiology. The term is derived from two Greek words, (*phusis*, Nature, and *legein*, to speak or discourse of.) Vegetable Physiology implies, therefore, an investigation of the natural structure of plants, and it also involves the anatomy or dissection of every part and portion of their organization from the seed to the most minute developments, external and internal; and thus, strictly speaking, it includes Botany, a word which has been misapplied when restricted to the floral organs of a plant.

But physiology is still more comprehensive in its pursuits, since it embraces the analysis of all the vegetable products; therefore it appeals to chemistry in the most refined and complicated processes of analysis.

With these considerations before us, and knowing that bold assertions have been resorted to on subjects whereon the most humble suggestions only should have been offered, we shall do little more than approach the science of physiology, by pointing out a few of the most prominent objects of research, adducing occasionally the theories of the day, with such remarks as shall appear applicable, in order to induce the inquiring and sagacious reader to investigate for himself, and to shun that blind credulity which is the greatest obstacle to the attainment of true knowledge.

With this caution, however, we would earnestly advise the student to avail himself of every opportunity to attend the lectures upon physiological botany; for though it is wrong to take anything for granted, experience and observation produce habits of research.

In the study of vegetable structure it would appear natural to commence with the *seeds*, or rudiments of plants; but their organization is so minute and complicated, that it might much perplex a beginner. We, therefore, shall for the present confine our attention to the external structure of plants; to those parts which meet the eye; referring for our authority to the simple arrangement of that sound physiologist, the late Sir James E. Smith, whose *Introduction toBotany* we recommend to the uninitiated reader.

1. The Root, *radix*, is the organ of nourishment, that by which a plant is attached to the soil, and absorbs the crude sap. It, in general, appears to be the first development of vegetable vitality, since the *radicle* is protruded from a seed into the ground, before the stem ascends. A beautiful example of this is furnished by a

fresh-fallen acorn being suspended in a hyacinth-glass, just above the surface of the water, with which the glass is to be previously three-parts filled.

If cuttings of any free-rooting plant, as of the horse-shoe geranium, be inserted in a phial of water, and kept at a heat of 60°, it will be seen that a ring of the substance called *callus,* is gradually formed between the bark and wood, portions of which become granular, prominent, and acquire length. These protrusions are roots, and with them the cutting becomes a plant; hence we infer that the root is the first vitalized production of vegetable germs, and though a cutting be a portion of secondary development, it is only a mutilation, and nothing better, till some vitalised pre-organized germs be brought into action in the form of roots.

The reader will perceive by the above attempted definition how much the mind labours in its endeavour to explain phenomena which are hidden in mystery! What children we are! talking of knowledge, and yet displaying our utter ignorance of causes and first principles! Still we know enough with reverence to admire.

The *Root*, according to *Lindley's Elements of Botany*, p. 10, differs anatomically from the stem, "in the absence of normal buds, and of stomates; in exogens, of pith."

We question the exclusive correctness of these theoretic assertions. It may be true that in those species whose roots are utterly incapable of producing suckers, there may exist no *normal*, that is, original or pre-organized germs, but in others, like the Rose, the Raspberry, Hazel-nut, Robinia pseudo-acacia, &c., which trace and wander extensively, protruding suckers in abundance, there must exist a system of buds, which contain the rudiments, at least, of perfect plants. It is known that if the cuticle of the Robinia root be wounded by a tool of any kind, a sucker will speedily be developed. *Neuchateau*, in his Treatise on the Acacia, established this fact years ago.—See *Withers on the Acacia*, pages 78-9, particularly.

The Elm is seen to intrude its suckers to an extent that becomes a perfect nuisance in orchards and garden grounds, bounded by a hedge-row of this tree. Thus we are apt to generalize by observing merely a few solitary facts.

We enter into no detail of the *varieties* of roots; referring to Smith's *Introduction*, Dr. Lindley's *Elements*, &c.: it will suffice to show that all roots, whatever be their form, are the organs which connect the stem and foliage with the medium of nutriment adapted to each individual plant; but it may be a question of some interest, whether *every member* above the soil has its own distinct system, or portion of radical fibres, or merely partakes in common with the general system. There exists no evidence to show that all plants, differing as they do in structure, character, and durability, can be governed by one common law. In the Vine we plainly perceive that numbers of fibrous roots decay and perish yearly; in *Evergreens* the fibrous system is extremely voluminous, and apparently permanent; in bulbs the true roots are more strictly annual.

In trees, the point of union between the ascending and descending stem, termed the *Collar*, may, perhaps, be viewed also as the point of separation—that, at which the ascending and descending vessels meet, and wherein the balance of power, of demand and supply, is duly regulated. In general, to cut a tree across at the collar is an act of destruction. Yet, as we have seen, the exceptions are numerous, since many roots abound with vital systems, which, being brought into action, develop suckers, that become trees or shrubs perfect in all their parts.

2. The Stem of trees and shrubs is a continuation—an extension upwards of the root, commencing at the division called the collar. It is composed of the bark, and its covering integument, the wood, and the *medulla* or pith. According to Lindley, *Elements*, No. 81, "The stem is produced by the successive development of leaf-buds, which lengthen in opposite directions."—"Leaf-buds consist of rudimentary leaves surrounding a growing vital point, the tissue of which is capable of elongation, upwards, in the form of a stem, and downwards, in the form of a root."—(No. 164.)

Herbaceous or vegetable stems, annual or perennial, and which never harden into wood, proper, consist of bundles and masses of juicy cells and tubular vessels of various forms, with specific portions of central pith (*medulla*).

On the subject of woody stems, as at present we are not speaking of tissue, it should be considered that they are evidently furnished with vital germs, numerous beyond the utmost stretch of imagination. We by no means are inclined to admit the idea of *fresh creations*; that which ever can or will be developed in any tree we believe to exist rudimentally in the *seed*: for finite minuteness does not enter into the question. The power which can produce the entire system of a tree from one single eye or bud, can equally produce the Oak with all its numberless developments of nine centuries, from the speck of life concealed within the acorn. Not, however, to indulge in abstruse speculations, it will be sufficient to observe that the branches, the spray or branchlets, the foliage, and finally the blossoms and fruit, are all of them the productions of *buds*; each bud is therefore a system of life, complete in itself, and attached to the tree by organs or vessels by which it is supported and fed. The supporters are fibres, and these pass into the branchlets, tending to confer substance, solidity, and springiness to each. If, then, a bud is complete in itself, and fully capable to produce the roots, trunk, and all the other parts of a perfect plant, and so on, as it were, *ad infinitum*, it follows that a tree raised from seed has derived all its members from that seed; may we not therefore safely conclude that, the embryo of the seed comprised all and every portion of the tree that will be developed throughout countless generations?

We shall have to notice hereafter the organic structure of trees and herbs of all kinds; but it now remains in this preliminary article to endeavour, by a few general remarks, to harmonize the two sciences of physiology and chemistry; or rather to prove that, so far as vegetable physiology is concerned, they are both one; for it is utterly impossible to ascertain the constituents of plants and their products without appealing to the analytic powers of chemistry.

We know nothing of the *Vital principle*—it may be a *Fiat*—partaking of the nature of the breath of life;—it may be sentient, conferring on a plant, however low in its degree, some trace of feeling and volition; or it may be electro-magnetic, acting altogether through the instrumentality of attraction and conduction. We lean to this last opinion, because we perceive in every act of nutrition some phenomena of chemical decomposition; but setting aside these considerations, it is quite certain, and will be self-evident to the philosopher who inquires aright, that every part of a tree or plant, and all its productions, *when deprived of life,* are subject to chemical laws, and can be explained by them and them alone.

To commence with the *wood (lignum)*, whether of the trunk or main root: we have nothing more to do than to examine the white ashes which are found in a bread-oven heated by billets. A little diluted *muriatic* acid added to a drachm weight, till the hissing or effervescence cease, will exhibit a clear liquid, with a quantity of grayish sediment at the bottom. The effervescence will show that carbonated alkali or earth existed in the ashes, which the clear liquid now holds in solution. If, into this, a few drops of prussiate of potash be let fall, a precipitate of Prussian blue will prove the presence of iron, which, being separated by a paper filtre, will permit the application of *carbonate of potassa* (salt of tartar) dissolved in rain water, to the remaining fluid. This will cause the copious deposition of a white substance, which, in almost every instance, is chalk.

Thus, in most kinds of wood, a quantity of chalk, some alkali, iron, and certain insoluble matters are found to exist, and are traceable by the two re-agents above named. These substances, as they are not destructible by fire, are termed the *inorganic* constituents of plants. The *organic*, or organized constituents, are those which are resolvable into the elements of water and air, combined in multifarious conditions with a volume of carbon, the base of fibrous, woody matter. These combinations are the origin of all the vegetable products—acids, starch, gum, sugar, oils and resins. They are decomposable by fire, which also disposes their carbon to combine with the nascent elements of the other products, and to pass off in the state of carburetted hydrogen, carbonic acid, and other gases.

The same volume of wood, which, burnt in the presence of atmospheric air, produces the white or gray ashes above alluded to, would, in the close retorts of the laboratory, yield, first—a quantity of impure pyroligneous *acetic acid*, and secondly—a bulk of black charcoal, equal to that of the wood, and exhibiting the figure and position of its fibrous and horizontal tissues.

The *leaves*, the twigs, and the minute roots yield, with some modifications, pretty nearly the same results; and thus we arrive at two important discoveries. First—that by the application of proper tests, we discover the elements into which all vegetable matters, organic and inorganic, can be resolved. Secondly—we learn that by analysis of the insoluble ashes, left after the combustion of plants of all kinds, we may arrive at a tolerably correct knowledge of the proper manure which any individual plant demands for its peculiar aliment.

The science of manuring, we admit, is in its infancy; yet its dawning has become manifest, researches have commenced, and the mind of man has begun to appreciate the powers with which it is gifted.

FLORAL CURIOSITIES.

Literature has its curiosities, which have been laboriously collected; art has ts museums of singular antique productions; and a variety of sciences their llustrations of the marvellous: but the oddities in flowers, though of unusual nterest, have never been brought together in collections, nor more than sparingly treated of in botanical works.

The resources of an infinite mind may be expected to produce a boundless and beautiful diversity of form and colour. Hence, when we see constant accessions of new plants, exhibiting different aspects from all that have been before known, we are hardly moved to astonishment. It is the remarkable similarity which certain species exhibit to common and familiar objects, which most excites our wonder and our interest. And so widely diffused are instances of this character, that botanists generally found the names of new genera on some actual or magined resemblance, in particular parts of the plant, to things with which most persons are acquainted.

The strange and elegant Pitcher-plant (*Nepenthes distillatoria*), with its charming miniature representative, *Cephalotus follicularis;* the pitcher-like leaves of the various Sarracenias; the trap-shaped form of the terminal portions of the leaves of *Dionæa muscipula;* the Snail-flower, recently depicted in our pages; the glandular bladders, like drops of dew, on the pretty Sundews and other plants; the frosted warty substances on the Ice-plant; and numbers of like subjects, are very generally known. The old-man Cereus (*C. senilis*), the Turk's cap Cactus (*Melocactus communis*), and the Elephant's foot (*Tamus elephantipes*), the clumsy woody stem of which is likened to an elephant's foot, are likewise pretty generally found in large collections.

But all the old-fashioned natural mimics in the vegetable world have been quite eclipsed in these properties by the large and increasing tribe of Orchidaceæ. Every plant comprised in it is itself a curiosity. Still, there are hundreds of them whose flowers take a prodigious variety of known shapes, borrowing their outlines alike from nature and art, and from nearly every department of both.

These have been very appropriately brought together, for the most part, in the last number of Mr. Bateman's splendid work on Orchidaceæ; and they constitute a group which, though sufficiently marvellous, might receive most extensive additions. Indeed, a little ingenuity expended on a tolerable collection of these plants, might furnish an almost endless fund of amusement; for there are few of them which do not impress the beholders with an idea that he has previously seen similarly-formed objects, though it is often impossible to remember what those objects are. Apt as illiterate and uncivilized people are in tracing resemblances, and characteristic as are some of the names given to Orchidaceæ by the natives of countries in which they naturally grow, there are many species in which our acute naturalists have discovered the manifest types or copies of other things, which had escaped the observation of the tribes among which they flourish.

One of the earliest introduced and commonest examples of the class of Orchidaceous curiosities was the Butterfly-plant (*Oncidium papilio*). This is now almost thrown into the shade by the lovelier Indian Butterfly-plant (*Phalænopsis amabilis*) The dove-like figure of the column in the flowers of *Peristeria*, and the fine arched column of *Cycnoches*, which well represents the beauty of a swan's neck, are two of the most pleasing examples.

It is not, however, in the ordinary forms of any organ in these plants, that they are alone to be regarded as curious. Species the most apparently distinct in character, with flowers of widely different shapes, are sometimes amalgamated on one plant. Sometimes the pseudo-bulbs, instead of being produced at the base of each other, grow on the top, and the flower-stems play similar freaks. Occasionally, likewise, young plants issue from the seemingly dead and slender flower-stems of old specimens.

To the admirers of the curious, then, no tribe can equal the Orchidaceæ in interest. And it is to be remarked, that they mostly combine extreme loveliness with this singularity; so that those who grow them chiefly as curiosities have the gratification of witnessing in them some of the most sweetly enchanting things which fertile nature anywhere begets.

ON PRUNING AND TRAINING PLANTS TO FORM STANDARDS.

In the kingdom of vegetable nature no plants are to be found which of themselves assume the forms which cultivators distinguish by the name of "standard," except those which are decided trees. All shrubs and minor classes which we meet with in a standard state, are rendered so artificially, or by some peculiarity of treatment. In the same way, trees are reduced to a comparatively dwarf condition.

Such changes of character are obviously induced in many instances for convenience; as circumstances will often render it next to impossible that a standard can be grown where a dwarf might be easily introduced, and the converse. But there re other motives besides convenience, which frequently operate to prompt the ulturist in altering the aspect of his plants ;—and these are the desire of novelty, nd the wish to produce improved effect.

Confining our remarks to the transformation of bushy plants into standards, it ust be acknowledged, that, in some instances where it is commonly practised, the hange is questionable enough in point of taste. A formal, close-headed standard ose, for example, is certainly far from being so intrinsically beautiful as a fine ompact Rose-bush. Still, the closely-pruned standard Rose is admitted into the est gardens; and this, because, however much it may fall short of the Rose-bush s characteristically ornamental, it is *in itself* an extremely pleasing and interesting bject.

Whether, therefore, the custom of forming bushy plants into standards be econcilable with the pure principles of taste, we shall not stop to inquire. It will ufficiently vindicate our advocacy of its adoption and extension, to show that it is ot so far inconsistent and extravagant as to fix the thoughts of the best-informed inds on its impropriety rather than on its attractiveness. And this is clear, from he favour with which neat and pretty standard shrubs of various kinds are egarded.

Since, then, it appears that artificially standard plants are not altogether anting in ornament, and do not outrage any principles of taste, we conceive it ust be desirable to bring them more generally into use, on the ground that they ould contribute, more than almost any other style of plants, to impart that harming variety to collections which is so necessary to the production of striking ffect. It is useless to strive against nature. And the love of variety is so anifestly a natural and ineradicable impulse, that, unless it is to be ministered to y that which is really ridiculous and objectionable, it should invariably be ratified. The gardener, especially, ought to be always fertile in novel expedients or securing and continuing the smile of his patrons; for floriculture is a pursuit hich, though singularly delightful, will necessarily, like every other, satiate and all the mind, unless its beauties be presented in fresh and varying forms and ircumstances. The tame, old-fashioned uniformity of treatment, which our ancesors adopted, will not suffice to maintain the interest of the art in the present day.

As one means of giving freshness and diversity to a collection of plants, hether in the borders or the houses, the practice of raising low and familiar ushes into standards will be found worthy of employment. By this plan, the utline or surface of a group, however small or large, may be agreeably varied; while it will serve to throw an interest around individual specimens that would not be otherwise noticeable. This will particularly be the case with respect to species r varieties that are well known in their dwarf character; for the transformation, if cleverly managed, will be all the more gratifying from the fact of its presenting the plant in an unusual and unlooked-for aspect.

Independently, however, of this treatment of plants being defensible as a means of awakening the love of novelty, it actually becomes, in some instances, highly advisable in an ornamental point of view. A standard plant is emphatically a beautiful object, if its due proportions be well preserved. It is only when these are violated—a thing which, unfortunately, too often happens—that it becomes a kind of deformity. It is impossible to give rules for preserving its symmetry. The eye will be the best judge; the main features to regulate being the keeping a proper balance between the length and thickness of the stem, and the size of the head.

We may turn aside here for a moment to observe that the ordinary method of trimming the heads of standards, so as to keep the shoots within very narrow limits, and to give them all the native inclination upwards, is extremely different from that which we have in view in advocating the preparation of plants after the standard fashion. It is by crippling and confining them in this manner that they are converted into the insipid and characterless things, against which the strongest objections would lie. Our way of training them, however, would be to give the principal shoots greater freedom; to let them grow to a greater length; and then, by the weight of the branches, or by the assistance of strings to confine them downwards, they would take a partially drooping direction, and assume an appearance which would be the very perfection of gracefulness.

Beyond the ornamental character thus given to standards, it would be advantageous to bring many plants to such a shape, for other reasons. Some species, which grow near the ground, would, by being elevated on a stem, be kept from getting soiled by rain, from becoming the receptacles of dead leaves, from having their branches broken by persons clearing the ground amongst them, or from being cut by the scythe where they are growing on lawns. Others, whose flowers are pendulous, and which would have them almost hidden, but for some such contrivance, would be brought freely into notice as standards. Another class, again, with blossoms of a comparatively small but beautiful description, especially those which are delicately pencilled, or which possess any sort of fragrance, would, by being trained into standards, invite a closer observation, or a more regaling enjoyment of their odours. A fourth group, of only annual duration, might in this way be turned almost into perennials.

For these and several similar purposes, the process of making dwarf plants into standards would be exceedingly useful. And, as is proved by illustrations which must be known to every cultivator, there is hardly a tribe of plants, which may not be more or less subjected to the operation.

There are two plans by which humble and bushy plants may be turned into standards; and these are grafting on standard stocks, and pruning. The last of them is the most simple and natural, the former being ofttimes the most convenient and expeditious.

To convert a plant into a standard by pruning, it is requisite that the knife be applied from the earliest period of the plant's growth, or at least from the time of its having completed its first year's progress, if a seedling, or from the very beginning of its developments, if reared from a cutting or layer. We make this distinction because a seedling plant (if it be a shrubby one) seldom commences branching before the second year of its existence; whereas, one raised by other means generally begins to branch at once, in consequence of mostly having upon it more than one mature bud. The best rule, however, relates to the disposition to branch; and a specimen that is intended for a standard, should not be suffered to branch at all until it has gained its destined height; for the way to form a standard well and quickly, is to keep it always growing upwards, without having any of its supplies withdrawn into lateral channels.

One of the readiest modes of ensuring an erect and vigorous growth to a standard, is to remove the rudimentary laterals as soon as they begin to burst forth. It is not wise to leave them till they have been developed three or four inches, as is usually done. They should be carefully and frequently inspected, and the expanding shoots cut out of the axils of the leaves or away from the stem, while they have yet hardly pushed beyond the bud-scales.

Here, too, it is necessary to guard against a mistake, into which an amateur might naturally fall, in supposing that, since the rapid upright development of the plant is sought, it will be advisable to leave the leading shoot alone, save by freeing it from laterals. Either because the energies of the plant get enfeebled and partly exhausted, or because the season grows unpropitious, or the supply of nutriment fails, or from some less understood cause, the extremities of the shoots of every woody plant are always more or less slender, weakly, and imperfect, whether those shoots be merely laterals or leading ones; and this is particularly apparent in some seasons, and under certain circumstances. Specimens in plant-houses are peculiarly liable to this degeneracy towards the points of their shoots.

Now, if the main and only stem of a young plant were thus contracted at the top, the probability would be, that the first growth it made in the following season, would be from some of the strong lateral buds situated on the stouter part of it. Indeed, this would almost certainly be the result; and as, by that means, the aim of the cultivator would be in a great measure defeated, the safer plan is to cut down the stem in autumn, as far as one of the most promising buds on the strongest part. When its growth commenced in the spring, the bud in question would be first excited, and would soon become the leading shoot, the rest being cut off as fast as they appeared. And provided the stem has been cut close to this principal bud, it will continue growing upwards with nearly as perfect a continuity as it if had never been severed.

When the required height of stem has been obtained—this height being constantly proportioned to its strength and to the general character of the head—the superfluous upward growth should be cut off, and the plant will then be excited to throw out laterals. These will have to be regulated, as well as to their number as their position; for they ought not to be much crowded, nor should they be encouraged at all except near the top of the stem. For the first year or two, they will have to be stopped several times while growing, in order to make them protrude other branches.

As soon as a tolerably regular and symmetrical head is formed, the pruning should be practised with less frequency and rigidity. Indeed, it will be rather thinning than terminal pruning which will then be requisite for a while, that the branches may immediately proceed to acquire that drooping character, which constitutes the chief attraction of a well-grown standard.

Throughout the progress in the growth of the stem, and the development of its head, it will probably need the aid of a stake, either on account of its weakness, or from its disposition to grow crooked. In fastening the stem to any stake, caution should be exercised in occasionally renewing the bands made use of, or they will be likely to cut the stem as it swells.

Adverting to the preparation of standards by grafting, we may notice that this system is pursued as a means of putting a weakly or feeble-rooting kind of plant on a more vigorous or better-rooting stock, or for combining several sorts on one stock, or for economy, where the plant used as a scion is a scarce and valuable one; or for saving time in rearing it, when the conditions are similar to those last mentioned. Where none of these reasons exist, it is better to form the standard by pruning; though it may be observed that the grafting method offers peculiar facilities for placing species or varieties which have pendulous shoots on the top of the upright stems of allied species.

Standard stocks for grafting upon can be procured in the manner recommended for ordinary standards. In grafting them, the stock should be employed while it is quite young; and if the top of it be only a little larger than the scion, they will the more rapidly and firmly unite. The graft can be put on the summit of the stock, or several can be inserted in it near the summit. Perhaps it is preferable to have only one, save where different varieties are to be introduced; as one terminal graft is more likely to receive, in a direct manner, all the supplies from the stock, and to elaborate and develop them into a regular head.

The scion, as it grows, should be stopped immediately after it has formed three or four eyes, that it may at once proceed to organize young laterals, and thus to furnish the rudiments of a compact head; these laterals being also stopped till they have acquired sufficient energy to produce other healthy shoots. Of course, in this, as in the former case mentioned, the stopping of the shoots will be determined by the nature of the plant; some kinds of plants requiring a great deal of this tendance, and others scarcely any.

Having now described the process of preparing standard plants, it only remains to point out some of the objects on which the practice may be carried out with advantage and success. Shrubby plants will, of necessity, be the objects to which it must be chiefly confined; and of such, the kinds with flexile branches seem to us best adapted for the purpose. The highest beauty of a standard is, in our view, its possession of a gracefully drooping or flowing head, which the slightest wind may agitate, and which will be additionally interesting when the species is a blooming one.

Of the hardy shrubs that may be turned into standards, we have, at different times, pointed out Rhododendrons, Portugal Laurels, Ivy, and Honeysuckles, besides those with which all are familiar. To these may be added the Laurestinas, the double-blossomed Furze, *Ribes sanguineum*, and probably *Kalmia latifolia*, with a variety of American plants. For standard Roses, we have likewise suggested the abandonment of so much pruning after the first three years, allowing the head to expand more, and the branches to incline downwards. This would take off all that stiffness which so much needs relieving. We have further recommended that the climbing sorts of Roses, or the less rambling of them, be inserted on standard Stocks, that a more graceful character may be at once attained.

The range of the operation as respects half-hardy and really tender plants, is far wider. It will include such large quantities, that enumeration would be almost endless. Standard Verbenas, Petunias, Pelargoniums, shrubby Calceolarias, Heliotropes, &c., would make very pretty objects in a conservatory or drawing-room; and there are few greenhouse or stove shrubs that might not advantageously be so treated. In raising them thus above the soil, air and light would act more efficiently upon it, and its condition as regards moisture might be better ascertained.

Finally, the widely known susceptibilities of Mignonette to assume a shrubby nature when trained as a standard, renders it more than probable that other annuals may be managed in a like way. Objects of interest and curiosity are here, therefore, placed within the easy reach of any one who will try the experiment.

The sole danger that we would wish avoided, is that of following out the practice too extensively or injudiciously. Our mode of treating the subject, demanded that we should exclude other views than those which bear upon it: but at a future period, we shall press the importance of a process precisely the reverse of this;—viz., that of rendering tall plants dwarf and bushy. At present, we may content ourselves with saying that only a few specimens of each species should be trained as standards, and that these should be *dwarf* standards, and not have the long, naked, slender stems which mostly disfigure plants so prepared.

We trust that this article will help to fasten attention on the point, and excite cultivators to try the capabilities of many graceful plants as standards. Climbers and half-climbers, particularly, where they can at all be brought to submit to such treatment, would give singularly elegant results. We have dealt chiefly with hints, which we leave the practical grower to apply.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR DECEMBER AND JANUARY.

ANGRÆ'CUM PELLU'CIDUM. "The flowers of this very beautiful little plant are as delicate and transparent as if they were flakes of snow fixed by frost in the very act of melting. Each part of the lip is studded and bordered with little crystalline elevations, and the whole fabric of the blossom is as fragile as thin plates of glass. It was imported from Sierra Leone by Messrs. Loddiges, with whom it flowered in November, 1842." Dr. Lindley states, that a comparison of this plant with *A. gladiifolium*, will show that the Genus *Angræcum* cannot be maintained entire, and will therefore have to be revised. It is a genuine epiphytal plant, with no real stems, large opposite leaves which sheath each other at the base, and bearing long, half-drooping racemes of flowers from the axils of the leaves. It is well fitted for growing on a log of wood. *Bot. Reg.* 2.

BOSSIÆ'A PAUCIFO'LIA. "This New Holland bush, which has been raised several times from Swan River seeds, is one of those plants whose appearance depends chiefly upon the way in which it is managed. Under ordinary circumstances, it is a straggling, naked, inelegant species; but when kept dwarf, and in very good health, it forms a pretty compact bush, gaily sprinkled with yellow and crimson blossoms. It was originally raised from seeds by Robert Mangles, Esq., of Sunning Hill; and in July, 1841, it was named and defined by Mr. Bentham. Afterwards it was figured in the Botanical Magazine, under the name of *B. virgata.* The drawing was taken from a plant in the possession of Messrs. Low and Co., of Clapton, in April last. It is a greenhouse shrub, and will best succeed if potted in rough peat mixed with a little loam and sand. When potted, the stem should never be immersed in the soil, but rather a little elevated, which will preserve the plant from damping off in winter. In summer an ample supply of water should be given, and air at all times. In winter it should be exposed as much as possible to the light, and always receive air when the weather will permit. Fire-heat should never be applied, except to keep off frost. It may be propagated from seeds or cuttings." *Bot. Reg.* 63.

CA'LTHA SAGITTA'TA. "First discovered by Sir J. Banks and Dr. Solander, in Success Bay, Terra del Fuego, in 1769; again found at Port Egmont, W. Falkland Island, by Ludovic Née, who accompanied the Spanish navigator, Malaspinas, in his voyage to South America; and more lately gathered in the Falklands by Gaudichaud, after the wreck of Capt. Freycinet's ship "L'Uranie," and by Capt. D'Urville, in the voyage of La Coquille. The specimens from which the figure was made, were collected in Hermit's Isle, Cape Horn, where it first attracted the attention of Capt. Ross, the commander of the Antarctic expedition, and was afterwards gathered abundantly both there and in the Falkland Islands by the other officers. The roots from the former locality were sent home by the botanist of the expedition from the Falkland Islands, where they had been flowering in November, 1842; and they again bloomed in the Royal Botanic Gardens of Kew, in the months of August and September. It is rather as a botanical curiosity than as an ornamental plant, that this species is here introduced. It is cultivated in moist bog-earth." It has sagittate leaves, and dull greenish-yellow flowers, being by no means so beautiful as the British *C. palustris*. *Bot. Mag.* 4056.

CIRRHOPE'TALUM AURA'TUM. Among the singular species of this genus, the present is one of the most interesting. It hangs down from the branch of a tree, or a piece of charred wood, which it soon overruns with its delicate green roots and egg-shaped, furrowed pseudo-bulbs. The leaves are very thick, deep-green above, and convex; stained with purple beneath. The flower-stem is as slender as a small thread, and too weak to bear the umbels of flowers, which therefore hang down gracefully, and are balanced in the air. The umbels, as in many others of the genus, are so arranged that the flowers are all on one plane, and diverging equally from the centre form a circle, whose interior is occupied by the lower part of the flowers, and whose circumference is formed by the long, flat, strap-shaped lateral sepals which look like so many party-coloured ribbons collected into a balloon. The flowers themselves have a yellowish ground, striped and mottled with crimson. The upper sepal and two petals are fringed with golden hairs, and pered into a fine point. The lateral sepals are quite destitute of hairiness, and only faintly ained with purple." It is a native of Manilla, whence it was received by Messrs. Loddiges, ho flowered it in March, 1841.—*Bot. Reg.* 61.

Cle′matis monta′na ; *var.* grandiflo′ra. "This handsome variety of the very fragrant *lematis montana* flowered in the open ground in the garden of Mr. Veitch, of Exeter, at the me time with the ordinary form of the plant, of which the blossoms are not half so large. Both re well worth cultivating in gardens, where there is accommodation for climbers. The profusion f large flowers, the delicacy of their colours, and their fragrance, are strong recommendations. he species is a native of Northern India. Dr. Buchanan Hamilton collected it at Chittong, in e valley of Nepal, flowering in April. Mr. Blinkworth gathered it in Kamoon, and Dr. Royle otices it as prevalent in the Himalayan mountains, at an elevation of from 5000 to 7000 feet bove the level of the sea. In our country it flowers in early summer, and indeed, through the onth of September. In a few years it ought to become a very general plant, for it strikes readily om cuttings, and from layers." *Bot. Mag.* 4061.

Convo′lvulus ocella′tus.—"A very neat Evolvulous-like species of Bind-weed, discovered by r. Burke, at Macalisberg, in the interior of Southern Africa, and raised from seeds in the greenouse of the Right Honourable the Earl of Derby, at Knowsley, where it produced its pretty white owers with a purple eye, in the month of August. "I can find no *Convolvulus*," says Sir W. J. ooker, "anywhere described, that corresponds with it. Indeed, I should have referred it to *volvulus*, but for the style and stigmas, which are truly those of a *Convolvulus*. The corolla is, s it were, intermediate between those two genera, between campanulate and salver-shaped ; carcely to be called rotate." It is a shrubby plant, procumbent at the base, bearing numerous lmost erect, silky branches, and rather thickly clothed with linear foliage. The flowers are orne singly on axillary peduncles. *Bot. Mag.* 4065.

Cro′ci Autumna′les. Under this title, figures are given of five species of autumn-flowering rocuses, viz., *C. pulchellus*, *longiflorus*, *odorus*, *Thomasianus*, *Pallasianus*, and *Cartwrightianus*. he Hon. and Rev. W. Herbert writes of them that "the first was sent to Spofforth by the indness of J. Cartwright, Esq., H. M. Consul-general at Constantinople. Having seen a dried pecimen of the plant from Roumelia, confounded with *C. speciosus* in Sir W. J. Hooker's herbaium, I requested that search might be made for it in the forest of Belgrade, where I thought likely to grow, and there it was found in flower without any leaf in October: It differs from all nown Croci in having *white* anthers and pollen. The filaments are also remarkable, being yellow nd hairy. *C. longiflorus* is a native of Italy and Sicily, and flowers with us in October, or ometimes later, the leaf accompanying the flower, which is very fragrant, of a pale-reddish lilac, ith the tube yellowish, and the throat of very deep yellow. It is closely akin to *C. odorus*, of ount Verdala, in Malta, whereof the leaves rather precede the flowers, and which has the throat ery much paler, and the sepals and tube striped with purple. *C. Thomasianus* has much affinity o *C. sativus*, and is a native of Italy. *C. Cartwrightianus* was obtained last summer from the reek island Tino by J. Cartwright, Esq., and was before unknown. It is evidently akin to *C. allasianus*. *C. Pallasianus* is found in Tauria, and said to grow also in the Cyclades, but is ot sufficiently known and examined. The figure given is from a dry specimen found by Professor esser in Tauria, for the sake of comparison with *C. Cartwrightianus*." These are all beautiful lants, and deserve to be grown as well on this account, as from the period at which they bloom. *ot. Reg.* 3.

Cyno′ches ventrico′sum ; *var.* Egertonia′num. "The concluding plate of Mr. Bateman's plendid work on the Orchidaceæ of Mexico and Guatemala, with its accompanying pages, are evoted to a most remarkable transformation of *Cynoches ventricosum* into that kind of *Cynoches* hich has been called *C. Egertonianum* ; and a history of their transformation is there recorded. he same subject is taken up by Professor Lindley, in the November Number of the Botanical egister, 1843, (Supplement), and a beautiful wood-cut is given of a portion of a raceme, bearing he flowers of the two kinds and intermediate states. There can be no doubt, therefore, of the ropriety of considering them as varieties of one and the same species ; a conclusion which could ot be arrived at by anything short of such ocular demonstration. In one respect Mr. Bateman's igure is still more remarkable, for the same pseudo-bulb bears two racemes, one of them exhibiting erfect flowers of *C. ventricosum*, and the other perfect *C. Egertonianum*, as if from the effect of grafting. The flowers of *C. ventricosum* are full four inches in diameter, with yellow-green sepals and petals, and a large white undivided lip." Those of the present variety are principally of a deep-purplish chocolate colour. In the stove of the Royal Botanic Gardens, Kew, where figures were made, "the respective varieties have hitherto continued constant, neither of them showing an approach to the other kind." The transition is one of those marvels in Orchidaceæ which seem specially designed to perplex botanists, and cannot be accounted for by any known laws. It certainly helps to throw around them a wonderful charm of novelty. *Bot. Mag.* 4054.

Diplolæ'na Dampie'ri. "A singular Rutaceous plant, with flowers collected into a capitulum like the Compositæ, but which, when examined, exhibit a very different structure. These flowers are fully produced in the greenhouse in the month of May, and have a very pretty appearance among the rather gloomy foliage. It is a native of Western Australia. Dampier appears to have first discovered it in Hawkes' Bay. It was collected during the voyage of Captain Baudin, at Terre d' Endracht, of the French voyagers; and both seeds and specimens have been sent by Mr. James Drummond, from the Swan River Settlement, from the former of which our plants were raised at the Royal Botanic Gardens of Kew. Mr. Allan Cunningham named a plant *Diplolæna Dampieri*, which he gathered at Dirk Hartog's Island; but this proves to be the *D. grandiflora*, of Desfontaines; the only other described species. A third has, however, been found in the Swan River Colony, by Mr. James Drummond, which may be called *D. angustifolia*. This has much larger flowers than *D. Dampieri*, and the leaves are very narrow, with revolute margins." *Bot. Mag.* 4059.

Euo'nymus japo'nicus. "In all respects this corresponds with the account given by Thunberg of the *Iso Curoggi*, or black shore tree, of the Japanese, even to the sporting into a silver blotched variety, also in our gardens. He says, it is in Japan a bush about as high as a man. With us it is not yet higher than three or four feet, but it has all the appearance of becoming much larger. Although no beauty is to be found in its flowers, this plant is of the same kind of value as the common Laurel, Phillyreas, and Alaternus, being a *hardy evergreen shrub*, with much of the appearance of a small-leaved orange. It is true that in very severe winters it is liable to be killed to the ground, but so are the Bay, the Ilex, and others; it, however, springs up again, and rapidly forms a new bush. When older it will probably become more hardy. It is easily increased from cuttings of the half-ripened wood, placed under a hand-glass or in a close frame, and shaded in summer. It flowers in July and August, but has not as yet produced fruit. There are two varieties, one with silver striped, the other with gold striped leaves; but the latter is very subject to run back to the green-leaved, while the silver striped hardly ever changes. It is called in many places 'Chinese Box,'—the name it bore when first introduced from Belgium." *Bot. Reg.* 6.

Gomphre'na pulche'lla. "Many attempts have been made to introduce into our collections the beautiful *Gomphrena officinalis*, from Brazil, but it is believed they have all failed. The next handsomest species yet known to us is the one now represented, which Mr. Veitch, of Exeter, imported from Monte Video, where it was first found by Sellon. It cannot fail to remind of our own well-known *Gomphrena globosa*; but the heads of the flowers are much larger, and of a brighter, though paler hue; and whereas the colour of the common *Globe-everlasting* is due to the floral bracteas, which are longer than the pale-green flowers, here, the coloured flowers are much larger than the bracteas, and give to the heads altogether a different character. It flowered in July, in Mr. Veitch's greenhouse. It appears to be an annual; and, in all probability, seedling plants put out in the early summer, would flourish in the open ground, and prove a very great additional ornament to our flower-borders." The leaves are opposite, lanceolate, very acute, and covered with silky hairs. The flowers are rose-coloured, on long, one-headed peduncles. The stems are nearly upright, and grow from one to two feet high. They branch, and are clothed with silky hairs. *Bot. Mag.* 4064.

Hibbe'rtia perfolia'ta. "This is really a beautiful Swan River Shrub, particularly well adapted to pot-culture, on account of the neatness of its appearance at all seasons. According to Baron Hugel, it has a tendency to climb, but that has not been observed in our gardens. When it first flowered it was of one uniform glaucous hue, almost as much so as the fruit of the plum when ripe and covered with bloom; but that appearance has gone off, and the foliage is now of a deep rich glossy green. While the beautiful yellow flowers are as large and showy, as in the old *ibbertia volubilis*, they are quite free from the offensive smell of that species. The drawing was ade in the garden of the Horticultural Society in May last. It there proves to be a greenhouse rub, requiring the same treatment as many other New Holland plants. It grows freely, if tted in a compost consisting of peat, loam, and sand in equal proportions. The pot should be ll drained, and a few pieces of potsherds mixed through the soil. Plenty of air and water must given in summer, and shade in sunny days. In winter the plant should be placed in some airy ace free from frost, and be watered in fine weather. It may be propagated by cuttings in the ual way." As the name indicates, the great peculiarity of the species is its having the leaves asp the stem at the base. *Bot. Reg.* 64.

MAMMILLA'RIA TETRACA'NTHA. "The plant figured has long been cultivated in the Cactus-house the Royal Botanic Gardens, Kew, under the above appellation ; and it appears sufficiently to cord with that of the same name published by Pfeiffer, the only author," continues Sir W. J. ooker, "so far as I can find, who has noticed it. His description, indeed, seems drawn up from young specimen four inches high, and three inches and a half in diameter, with the mamillæ and uleæ small in proportion ; and the flowers were, probably, unknown to that author, since he does t mention them. It is a native of Mexico, but by whom introduced to Europe, I do not learn. flowers in July." The flowers are produced abundantly round the summit of the plant, and e of a bright full rose-colour, paler in the disk. They are rather small. *Bot. Mag.* 4060.

ONCI'DIUM BI'COLOR. "This charming species of *Oncidium*, one of the rarest of its genus, was tained by Messrs. Loddiges from the Spanish Main. It flowered with them in September, 1842. mong other peculiarities of the species, may be mentioned its very thin pseudo-bulbs, and three-bed crest of the labellum, the front lobe of which projects forward, while the laterals are at ght angles to it, and slightly toothed. It has, moreover, a very large lip, which, though deep ear yellow on the upper side, is almost white underneath, as also happens in some of the Chive-ved species. Its nearest affinity is with *O. bifolium*." It seems quite as beautiful as that fine ecies ; and is, doubtless, equally adapted for growing in a pot, or on a block of wood. Whichever y it is treated, the plants should be suspended from the roof of the house. *Bot. Reg.* 66.

OPERATIONS FOR FEBRUARY.

WITH the exception of two or three days' frost, we have yet had nothing that can be called vere weather, and hence, though fuel will have been economized, and also a considerable amount the labour usually bestowed on covering up houses and frames, the plants themselves will obably suffer from this unusual mildness. At any rate, it seems likely to be a trying season r the cultivator, and to put all his skill to the test ; for while common expedients and ordinary tchfulness will preserve plants from being damaged by cold, it is an extremely difficult matter prevent their being injured by the long occurrence of comparatively warm weather in winter.

So much is said about the precocity of vegetation in the open air, that it is quite impossible r exotics, within doors, to have escaped a similar, or even greater stimulation. All the aims of e culturist should therefore be directed to repressing this undue excitement. And this on two counts. First, the days are not—and will not be for some time—long enough, nor the sun bright ough, to perfect the young developments that may be made. And, secondly, it is more than kely that, before the next two months have passed away, we shall have at least some of winter's mmon attendants, and which, if they occur while plants are in a growing or excited condition, ll be felt all the more seriously and prejudicially for such a circumstance.

The obvious modes of checking any kind of growth at this season are, to keep the houses and ames as constantly open as the dryness and warmth of the atmosphere will permit. If the ermometer is maintained above 45°, or about 48° in stoves, and above or about 40° in green-uses, cold pits, and frames, this will be quite high enough ; and when it gets many degrees ove that, save on those days during which the sun is shining brightly and a large quantity of r is supplied, the plants will only be deriving injury. Very damp days are, of course, to be cepted.

Another method of keeping down excitation is to be very sparing in the administration of water. No plant ought to be watered much before the proper season of development arrives; for an abundance of water at this time would inevitably cause the shoots to begin growing, should the weather continue open.

A third way of retaining torpidity is scrupulously to refrain from potting plants, however much they may seem to demand it. If re-potted now, they would be sure to continue their growth; whereas, by keeping them in the old pots, they will be less liable to be acted upon by the genial weather.

The young shoots of plants that are at all beginning to push forth, should likewise be stopped at once by pruning. If cut off with a sharp knife, almost down to the junction with the old wood, they will receive a powerful check. The same remark applies to those which are about prematurely to produce their flowers, unless for novelty it is desired to have them bloom thus early, instead of at the natural period. It should be borne in mind that *two* sets of blossom are not very likely to be obtained; so that if an imperfect production be now allowed to expand, there will be little chance of having another and better one this year.

It is scarcely necessary to say, that none of these observations can have any reference to plants which, from whatever reason, are now unavoidably in a growing state. Such are several of the Orchidaceæ, young or newly imported specimens of various stove or greenhouse plants, specimens which are being forced for their flowers, and others, which, from their rarity, are subjected to bottom-heat, in order to obtain shoots for propagation, or which have been recently multiplied by cuttings. The prudent cultivator will have as few of all these (save forced flowers) as possible.

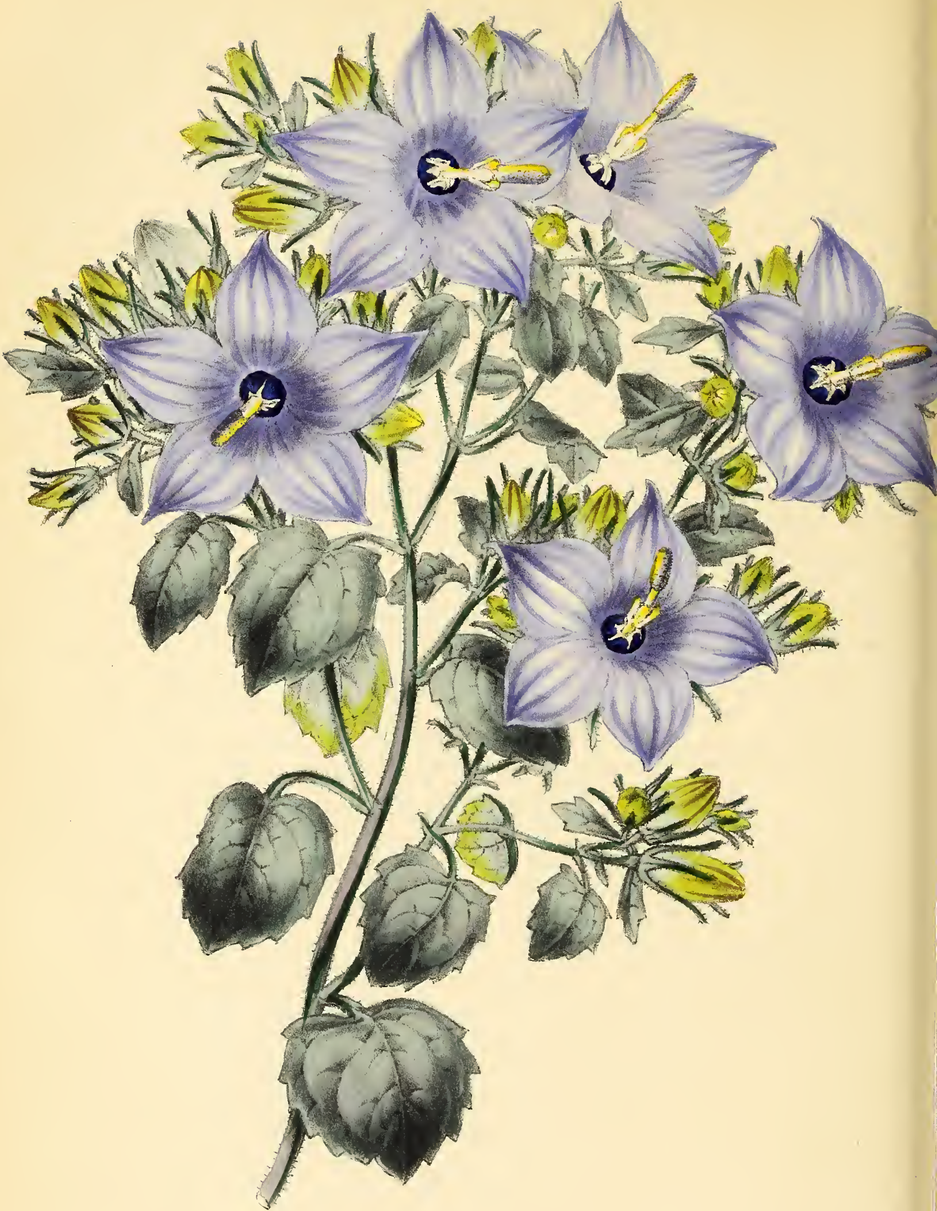
As the days become longer, and the sun gets a greater power, the forcing house, pit, or frame should be gradually rendered warmer, that the healthy progress of the plants may be accelerated, and the supply of them be increased with the opening spring. There are many pretty annuals which will bear forcing, and which have a most elegant appearance among the less graceful though showier things generally employed. *Nemophila insignis* is a good example in point. Suspended from the roof of a show-house containing forced plants, or placed on an elevated shelf, with its branches left carelessly to droop around the pot, it is a very pleasing and acceptable remembrancer of summer.

On no pretence should forced shrubs or bulbs be discarded after they have been used for forcing. They ought to be placed in a spare house, pit, or frame, to mature themselves, that they may be similarly employed in the following season. It is a most unwise piece of extravagance and inconsiderateness to throw away such plants, or to cast them into some corner as if they were worthless. We have never yet seen them properly taken care of; but, as we cannot here pursue the subject, we must revert to it at another period.

Of out-door work, there are the tender shrubs, and other plants that need protection, to attend to, and to cover and uncover as the weather may range. It should be remembered that an error on the side of too much covering is calculated to prove almost as detrimental as any neglect of an opposite character. Every opportunity for exposing them should be strictly seized upon, and only extreme cold guarded against. It is not, however, frost alone that can do them harm; driving winds are sometimes equally destructive, particularly to evergreens. But while shelter on all sides is essential in cases of frost, protection of that side alone from which the wind comes is requisite during cold blasts, if unaccompanied by frost. This distinction is of some consequence, because even partial exposure, if it can be safely afforded, is beneficial to tender exotics in the winter.

This is, moreover, the time for effecting all kinds of new ground-work; as, being mostly frosty, all sorts of wheeling can be done with greater ease and cleanliness. It is also a good period for putting on manure, and for taking away timber that has been felled, or any sort of prunings. By arranging the performance of these things in frosty weather, the neatness and good keeping of both walks and roads are much promoted; and the work is further accomplished with less labour.

The pruning of shrubs and trees, and the digging of beds or borders, may be carried on now, where necessary; but not during the occurrence of frost. Roses and other shrubs can be layered; and where stakes are required for any woody plant, they should immediately be given. It is better to examine all that are thus supported at the present time, and also to renew the bast or twine with which they are fastened, if requisite.



S.Holden del & Lith.

Campanula fragilis hirsuta

CAMPÁNULA FRÁGILIS; *var.* HIRSÙTA.

(Hairy fragile Bell-flower.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
CAMPANULĀCEÆ.

ENERIC CHARACTER.—*Calyx* five-cleft, having the
uses usually covered by appendages. *Corolla* five-
ed or five-cleft at the apex, usually bell-shaped.
mens five, free; filaments broad at the base and
mbranous. *Style* covered by fascicles of hairs, ex-
t at the base; stigmas three to five, filiform. *Ova-*
m wholly inferior, three to five-celled. *Capsule*
ee to five-valved, dehiscing laterally. *Seeds* usually
te, flattened, ovoid, and small.

SPECIFIC CHARACTER.—*Plant* herbaceous, perennial. *Stems* ascending, diffuse, branched. Radical *leaves* on long petioles, roundish cordate, bluntly crenate-lobed; cauline leaves smaller, ovate and lanceolate. *Flowers* panicled. *Calyx* with linear-lanceolate lobes, erect, about equal to the corolla. *Style* exserted. *Capsule* ovoid.

Var. hirsuta.—*Plant* hispid, and as if it was covered with wool.—*Don's Gard. and Botany.*

OF the many lovely plants belonging to the genus *Campanula*, we hardly ow one which excels the present variety in beauty. And yet, somehow, it is t an object in which cultivators generally evince much interest, or which they ow to anything like its attainable perfection.

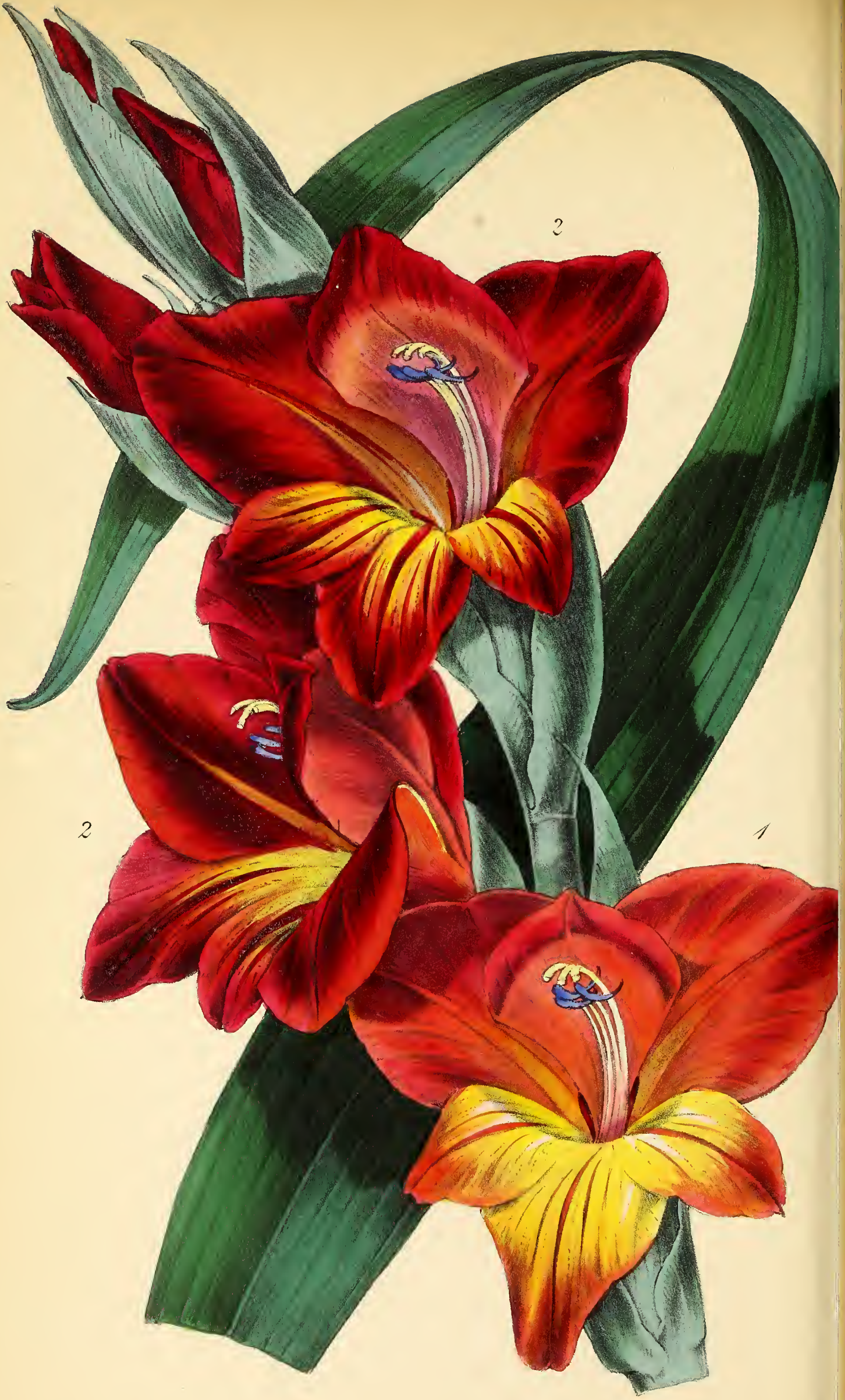
The specimen which supplied a subject for our drawing was bloomed, in the mmer of 1840, at Messrs. Henderson's, Pine-Apple Place, where most plants serving of attention are cultivated with a care which is truly delightful. It d by some means got the name of *C. carolina;* an appellation the origin of hich we cannot trace. In a greenhouse, however, the plant was covering a pot out eight inches in diameter with its charming blossoms, which were also ofusely borne on some branches that were hanging over the sides of the pot.

In its habit, the plant is very dense and compact, bearing a considerable mber of branches, and large flowers, which are more expanded and star-like an those of most Campanulas. It is one of the neatest of greenhouse ornaments, d, from the soft blue of its pleasing flowers, and the bright green of its foliage, tracts most persons' notice.

Nothing can be done in the way of developing this beautiful plant's good operties, or cultivating it advantageously, unless it be put in well-drained and rous earth. De Candolle observes, that it is seldom met with farther north an 41° of latitude; that it occupies the evergreen region of Italy, and even extends itself into the lower woodland region, as far almost as the upper limits of the Beech, or to 3000 feet above the level of the sea. It hangs over the face of limestone rocks.

To adapt its treatment to the peculiarities of its native situation, it ought to be grown in a very sunny part of the greenhouse, where it gets little moisture except while growing. The soil should be a very open loam, with a little leaf-mould; neither of which must be at all sifted. A little limestone mixed with it, or some pieces of broken sandstone, will be useful; as it is essential that the soil be kept thoroughly drained. In the winter it needs hardly any water, and a particularly dry position. An upper shelf in a greenhouse is the best place for it at all times, save when it is flowering.

It may be increased by cuttings of the fresh shoots, taken off in spring, and placed in a trifling bottom-heat.



S Holden. del & Lith

Gladiolus Gandiensis.

GLADIÒLUS GANDIÉNSIS.

(The Ghent Corn-flag.)

Class.
TRIANDRIA.

Order.
MONOGYNIA.

Natural Order.
IRIDÀCEÆ.

Generic Character.—*Inflorescence* alternate, distichously spicate, few or many-flowered, with a two-valved lanceolate spathe. *Corolla* superior, tubular, six-parted, funnel-shaped, irregular; tube erect, slender in the throat, short or cylindrically elongated; limb six-parted, two-lipped, subequal and divaricate, or very unequal. *Anthers* linear-oblong. *Style* with the same direction as the stamens. *Stigma* with three elongated lamellæ, obversely attenuated, replicate. *Capsule* membranaceous, ovate-oblong, obtusely trigonal, three-celled, three-valved; valves seed-bearing in the middle. *Seeds* numerous.

Specific Character.—*Plant* a garden hybrid, resembling *G. communis*, but much larger and handsomer.

Few cultivators seem to be aware of the great capabilities of the genus *Gladiolus* for ornamental purposes, and hence we commonly see the better species cramped into comparatively small pots, with a poor soil, and reaching only half the size and beauty which they would acquire by being subjected to better treatment.

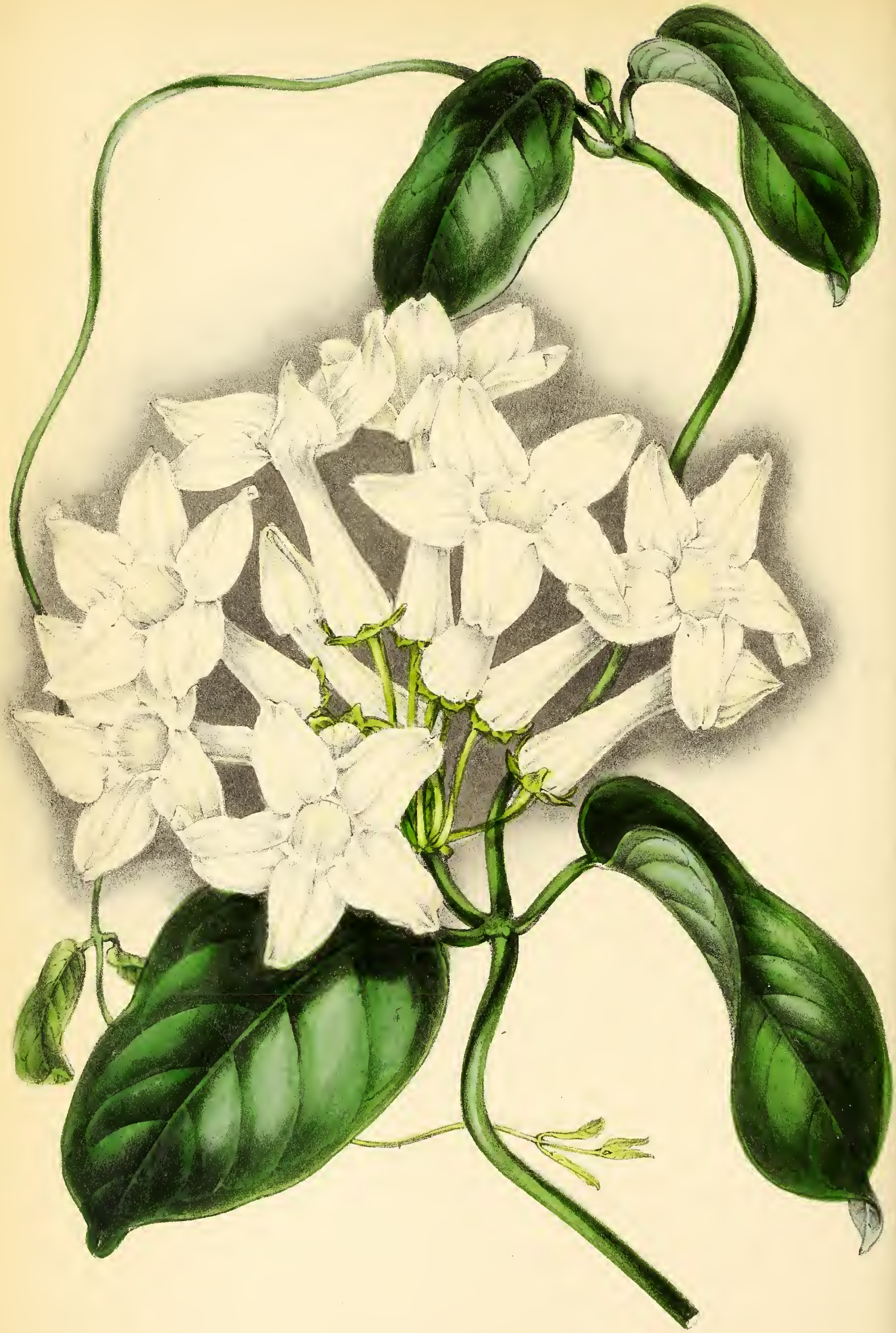
It is as border plants, especially, that they prove so peculiarly showy; whether the border be in the open air, sheltered from behind, and having a southern aspect, or whether it be in a pit or frame, or low conservatory. When planted out in a free soil, they appear to take a new character, and become objects of the most splendid description.

G. Gandiensis, which has probably received its name from having come from Ghent to this country, is an exceedingly good addition to the genus. It is evidently of hybrid extraction, and *G. communis* is most likely one of its parents. To that species, indeed, it bears much resemblance; but has more of the open flowers of *G. pudibundus*, with a slight indication of its tints.

Whatever may have been its origin, it is certainly a noble plant, and flowers in great abundance. Our drawing was made from two places in the neighbourhood of London, during the last summer; the flower, No. 1, having been obtained from Mr. Mountjoy's, of Ealing; and No. 2, from Messrs. Rollisson's, Tooting. There is a trifling difference between the two; yet both are obviously from the same parentage. With considerable boldness of habit, they combine a highly ornamental inflorescence.

To grow this and other Gladioli favourably, they should be planted in a rich soil, not too much pulverized, and effectively drained. If kept in a pot, that pot ought to be a pretty large one, for they will not thrive luxuriantly when much confined at the roots. The fittest situation for them is a prepared border in a pit, or in front of a plant-house. Wherever they are put, however, the bulbs should be taken up yearly, after the leaves have decayed, and re-planted about the month of November.

Propagation is carried on by separating the young corms, at the time of removing them from the ground; but it is desirable to put two or three of the old ones together in a tuft when a fine specimen is wanted.



S. Holden, del. & Lith

Stephanotis floribundus.

STEPHANÒTIS FLORIBÚNDA.

(Free-flowering Stephanotis.)

Class.
PENTANDRIA.

Order.
DIGYNIA.

Natural Order.
ASCLEPIADÀCEÆ.

Generic Character. — *Calyx* five-sepalled, shorter than the corolla. *Corolla* salver-shaped; lobes obliquely contorted. *Crown of stamens* simple, five-leaved; lobes membranaceous, erect, entire. *Anthers* terminated by a membrane; pollen-masses in pairs, erect, fixed at the base. *Stigma* conical, acute.

Specific Character.—*Plant* an evergreen climber. *Leaves* opposite, elliptical, thick, dark green, entire. *Umbels* axillary, many-flowered. *Calyx* small, five-lobed. *Corolla* with a tube which swells at the base, and a limb composed of five ovate, obtuse, spreading segments.

No plant could have more properly been called "free flowering" than this most enchanting climber, for it bears a large cluster of flowers from the axil of every leaf, and these are developed on plants not more than six inches high, while there is an almost interminable succession of them. Indeed, there is scarcely any of our stove favourites which can compete with it in the profuseness of its blossoms.

We find, from the Botanical Magazine, that its native country is Madagascar, and that Mrs. Lawrence, of Ealing Park, whose celebrated collection is so rich in really ornamental plants, had the pleasure of introducing it to England.

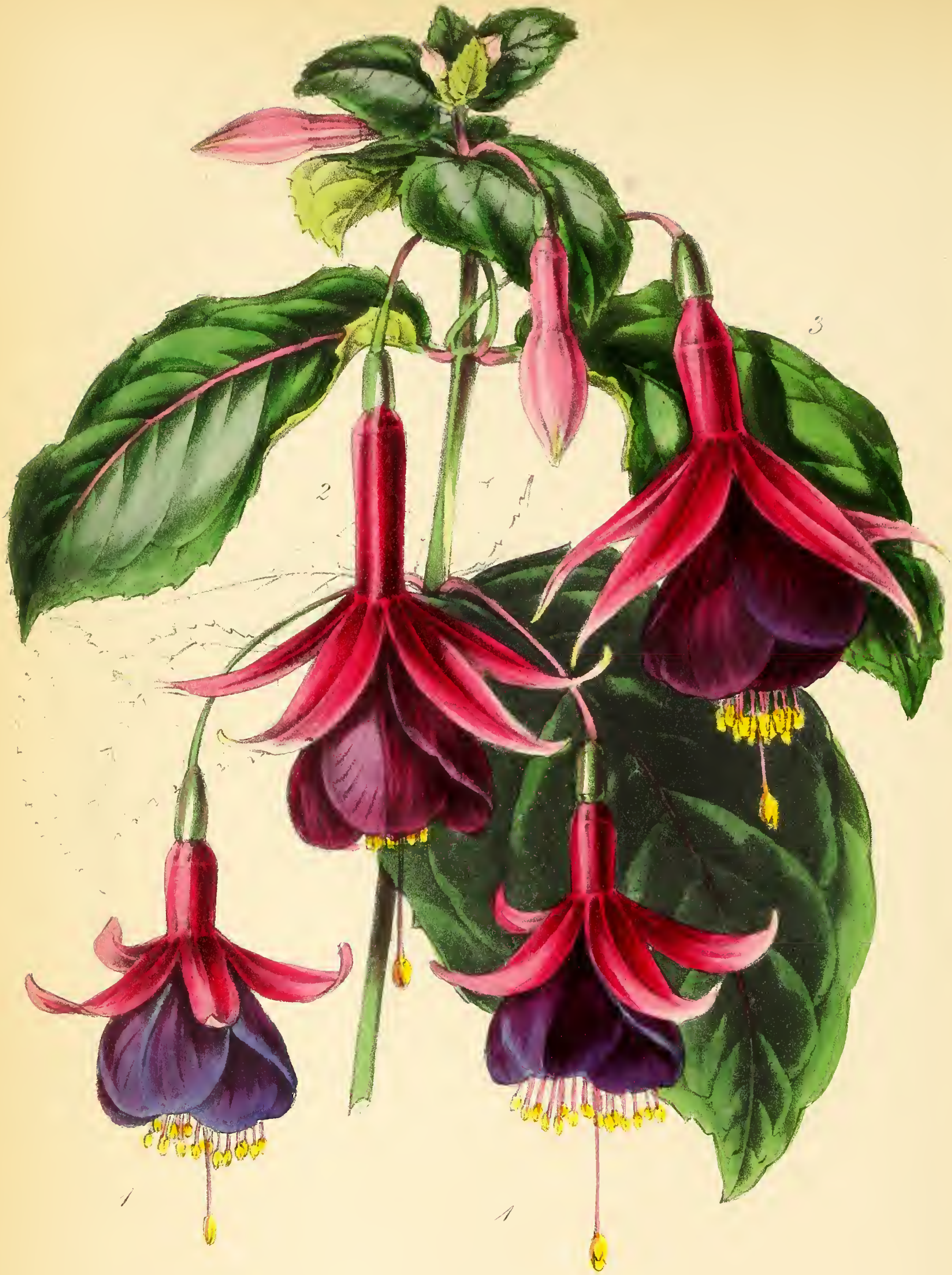
It is next to impossible to overrate its merits; they are so essentially sterling. Besides having a most elegant climbing habit, it bears dark shining foliage of a pleasing order, and from the axils of this the delicate, creamy-white blossoms are protruded in large umbels. The texture of the flowers being very firm, they last a considerable time, and their odour is exceedingly delicious.

As a plant for training over the roofs of stoves, and especially of Orchidaceous houses; or for growing in a pot, and twining round any kind of trellis; or for keeping in a small state supported by a stake, as an erect shrub, it is almost equally interesting. But, though we have said that it flowers abundantly while very dwarf, this is only when it is appropriately treated; as some cultivators can hardly get even large specimens to bloom well.

To ensure an early and continued display of flowers, the young plants should be raised from the upper shoots of the specimens that have exhibited high blooming propensities. A cutting taken from a luxuriant plant which grows vigorously and flowers but seldom, will not so speedily make a free-blooming specimen as one taken from a plant that has already manifested a disposition to bloom freely. The soil is another of the things which affect fertility. It must not be rich; nor should the pot be deep or large. If the roots lie near the surface of the soil, the blooming power will be increased.

No conditions suit the plant so well in summer as a warm, moist, close atmosphere, like that of an Orchidaceous-house. But it is indispensable that it be kept cool and dry through the winter, otherwise it will not blossom well.

The species is increased by cuttings, which, as before hinted, should be made from the points of the young flowering shoots.



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Fuchsias (Standish's)

1. 1. Attraction. 2. President. 3. Colossus.

STANDISH'S SEEDLING FUCHSIAS.

(1. Attraction. 2. President. 3. Colossus.)

Class.
OCTANDRIA.

Natural Order.
ONAGRACEÆ.

Order.
MONOGYNIA.

GARDEN HYBRIDS.

THE hybridization of any popular tribe, when once the practice is brought thoroughly into vogue, is speedily carried to an extent which renders characteristic distinctions indefinable; and perhaps the introduction of the numberless names which necessarily arise out of such a circumstance is to be regretted, as occasioning difficulty and labour beyond what most cultivators are disposed to submit to. For the purposes of sale, however, and also to enable one grower to recommend very particular sorts to another cultivator at a distance, it is essential that every seedling or variety that is at all deserving of being perpetuated should have a distinctive appellation.

It is this view of the case which leads us to adopt the names of the very handsome Fuchsias now depicted. The family to which they belong has rapidly grown, in the hands of the hybridist, to a size which is quite inappreciable; and of its multitudes of members, there are not many which will stand the test of time. The present seedlings possess, notwithstanding, a superiority in several points which will entitle them to general favour; and, like *F. Standishii*, they appear likely to continue in cultivation after others of a less attractive order have been discarded.

Mr. John Standish, nurseryman, of Bagshot, who raised the beautiful hybrids already referred to, has likewise originated the seedlings figured on the accompanying plate. They are three of six fine sorts obtained in the following manner :—In 1841 he raised a number of seedlings from Thomson's *formosa elegans*, by *corymbiflora*. They were very pretty, and free growers; but not particularly different from the hybrids of *F. fulgens*, except that they seeded abundantly, which those hybrids rarely do. Having saved some of those seeds without any fertilizing, Mr. Standish was astonished to find, in 1843, that the produce had acquired so much larger leaves and flowers, as to be nearly twice the size. They are more soft-wooded than the hybrids of *F. fulgens*, and exhibit the interesting fact, that instead of degenerating, as most florists' flowers do when propagated by seed without being fertilized, they improved to a very great degree. Mr. Standish thinks, indeed, that still higher improvements may be made by sowing the seed of the last generation.

Our artist has tastefully represented the three varieties on one stem, for the sake of effect. The flowers are, however, numbered, in order to distinguish them; and the habit of each is very like the others. They are close-growing and neat. No. 1 is called Attraction, and has the pleasing aspect of the old *F. globosa*, with rather longer and more acute as well as reflexed sepals, and immensely larger corollas, which are of the richest purple. No. 2, named President, is a longer and bolder flower, more in the way of *F. Standishii*, with a much better corolla. Colossus, No. 3, has a shorter tube to its flower, less reflexed sepals, and a particularly fine purple corolla. They are all meritorious and delightful objects.

GARDENING AS A SCIENCE.

VEGETABLE PHYSIOLOGY.—No. II.

It appears certain, whatever be the structure of a plant, that there is a point of union between the root or the descending organ, and the stem,—the part or parts which ascend, and luxuriate in solar light,—at which two systems of vessels unite (inosculate) and distribute to each, in opposite directions, the fluids required by each. This point of union is called the neck (colla) or collar. All that part through which the sap ascends, and from which buds, branches, and leaves proceed, is therefore with propriety called the *Stem.*

A distinction, however, might be made, inasmuch as the main ascending portion of trees and shrubs is manifestly the stem, in the common acceptation of the word; but physiological botany of the modern school admits of no such distinction: it indeed sanctions the term *woody* stem; but it claims the right to consider as stem, every central portion which is above the collar of union; and thus the bulb in the tulip, the amaryllis and crocus, is a stem, the base of which is the collar, whence the fibrous roots pass into the earth.

This being admitted, we appeal to the authority (the most modern) of "Lindley's Physiology" for the following positions:—

"The *stem* varies in structure in four principal ways. First, as being formed by successive additions to the outside of the wood,—it is then called *Exogenous*, (derived from the Greek word εξω, without or outside, and γενω or γενειν, to produce; second, by successive additions to its centre, when it is called *Endogenous* (from ενδον, within); third, by the union of the bases of leaves, or by addition to the point (ακρον,) whence the term *Acrogenous*; and fourth, when a stem has the structure of an Endogen, and the root that of the stem of Exogens, called *Dictogens*, (from Δικα, in two ways).

These four classes will be noticed in due order; and first, *Exogenous* Stems. When a seed with two seed-lobes, is excited, it first protrudes a root, by which it fixes the future plant in its medium of nutrition—the soil:—it then produces the seed-leaves and the rudiment of the ascending stem called the *plumule*, consisting chiefly of soft, juicy cells or tissue, among which pass downward and upward—that is, in a vertical direction—a number of delicate fibres, which are the rudiments of the fibrous system that subsequently becomes the basis of solid wood. If a tender stem of any young seedling shrub or tree, be cut lengthway and across by a delicate instrument, the truth of these assertions will be clearly established. There will be found a marked separation between the fibrous and cellular tissues; the two-fold arrangement being in a great degree symmetrical.

This is more obviously discernible in trees, wherein there is a regular progressive deposition of woody matter: but it is not less true in plants of herbaceous families, wherein the stem, though it become not woody in the proper sense, yet exhibits the essential characteristics of the class. These may be described in the following order:—

1st. A central column of pith, which extends no lower than to that point of division which is styled the collar, already described: this pith, or central column of cellular pulp, important as it is as a source of nutriment to the earliest developments, may also be the conduit of those electric currents which connect the vital agencies of the tree with the earth through the medium of the absorbent roots.

2nd. The pith is surrounded by a *sheath*, in which are numbers of those wonderful appendages, called spiral tubes, to which (as they are generally and indispensably present in the earliest and future young developments) we incline to ascribe the flexibility and rotatory mobile power possessed by trees and shrubs in a degree so extraordinary; but of this more must be said hereafter.

3rd. Exterior to the *medullary sheath* we find layers of cellular tissue arranged in the form of rays, diverging more or less, as the spokes of a wheel, but interposed with vascular or ligneous fibres which are also incorporated with them.

4th. The rays diverge till they approach or touch the outer integument, called the bark; whence, according to Mr. Knight, they *converge* towards the pith. The above characters are traceable in stems of one year's growth.

During the future progress of exogenous stems, the pith does not increase; on the contrary, its column appears to contract; and now the horizontal, cellular, rayey masses, appear more closely connected with the newly-formed layer of *liber*, and rather more remote from the central pith. The woody system of the first year becomes more compact, while the newly-developed system of descending fibres, with its interposed cellular rays, assumes the character of the tender, sappy wood of the present year, called *Alburnum.*

When a student inspects the wood-cuts and descriptive plates of botanical writers, he is apt to conclude that the order of development and growth, is regular as the wheels and cogs of a highly-finished piece of machinery. And it must be confessed, that in the many specimens of horizontal slices which were sold as "*Custance's Vegetable Cuttings*," the arrangement of the rays and interposed vascular descending vessels is beautifully symmetrical. Yet, the anomalies of Nature are very great, and much perplexity might be occasioned during more extended investigation, were it taken for granted that strict uniformity of structure must prevail. The inquiring reader will obtain much light on this subject by referring to the article "EXOGENS" in the "Penny Cyclopædia," elucidated by many figures.

Any attempt to explain the origin and functions of the various constituents, must be attended with extreme difficulty. The *rudiments* of every part certainly exist, and may be partly traced in the microscopic investigation of the *seed:* and here we may remove one source of error, by observing that all *exogenous* stems do not originate in seeds with *two* Cotyledons; for there are many exceptions, some seeds having four, six, or more seed-lobes, but in every instance it appears that their position is regular, and *opposite ;* and the future developments are, in a great degree, two-fold and distinct.

The following positions are extracted from the Cyclopædia, though of necessity somewhat abbreviated :—

" 1. As soon as germination commences, fine ligneous cords proceed from the cotyledons towards the radicles from the opposite sides of the young stem meeting in the centre of the embryo.

" In *this first position* we perceive the earliest development of the fibrous woody matter of the root, which fibres are accompanied with a certain quantity of interposed cellular tissue." If then these two-fold developments are propelled from the seed by the excited vital principle, that seed or embryon must have comprised their elementary rudiments.

" 2. The *plumule* or rudimentary stem becomes organized, and, having lengthened, forms upon its surface one, two, or more true leaves, which gradually expand into thin plates of cellular substance traversed by ligneous cords or veins converging at the point of the origin of the leaves. If the interior of the young plant be now examined, it will be found that more ligneous cords have been added from the base of the new leaves down to the cotyledons, where they have formed a junction with the first wood, and have served to thicken the woody matter developed upon the first growth."

" Those ligneous cords which proceed from the base of the leaves do not unite with the centre of the stem, but pass down parallel with the outside, and leave a small space of cellular tissue in the middle."

We hereupon remark, that in this second position, the Physiologist lays the foundation of his theory, namely, that the woody matter of *Exogens* proceeds from the leaves to the roots in parallel lines—or, in other words, that the *leaves generate wood.* Now, it is quite certain, that leaves are formed at a very early stage after germination, before ligneous fibres become distinctly traceable ; and if the hypothesis of Liebig be correct, that the *absorption of carbonic acid from the atmosphere* is one of the primary offices of the leaves, the theory acquires substance. Carbonic acid is formed by a union of oxygen gas, during combustion, with the base of charcoal : it also exists abundantly in chalk, and is developed in every act of rapid or slow combustion. As the air therefore must of necessity abound with this gas, it is reasonable to infer, that leaves absorb a portion of it. And as, moreover, fibres may be traced at the base of every leaf, and be proved to pass into the stem, we are further inclined to consider this connexion with the fibres of the stem sufficiently established : but we yet suggest the admission that the office of the leaves is nutrimental, not creative, the rudiments of leaf, fibre, and cellular tissue, being present in the plumule at the moment of its expansion from the embryo.

" 3. The stem goes on lengthening, and forming new leaves : from each leaf there may be again traced a formation of woody matter disposed cylindrically, as before, and uniting with that previously formed, a cylinder of cellular substance being left in the middle, and the solid woody centre of the root proceeds in its growth in a corresponding ratio, lengthening as the stem lengthens, and increasing in diameter as the leaves unfold, and new woody matter is produced: the result of which is, that when the young exogen has arrived at the end of its first year's growth, it has a root with a solid woody axis, and a stem with a hollow woody axis surrounding cellular tissue, the whole being covered in by a cellular integument."

The whole of the foregoing extract is consistently in accordance with the previous positions; and, therefore, we only remark, by way of caution, that the tyro in physiology must not take it for granted,—although a *woody* stem be assumed as the type, that the theory does not equally apply to exogenous stems of all kinds, whether the plants be herbaceous or otherwise;—for example, those with spindle (*fusiform*) roots, as carrot, beet, and the like, which afford, under the microscope, evident marks of a corresponding structure; but of this our proofs will not be complete till we investigate the nature and offices of the foliage. Again:—

"5. But as the woody cords are merely plunged into a cellular basis, the latter passes between them in a radiating manner, connecting the centre with the circumference by straight passages, often imperceptible to the eye, but always present."

Two drawings are then given, which convey an idea of the cross sections of the root and stem at the end of the first year; they exhibit in the former the radiation of the fibrous and cellular matter from a *solid centre*, toward the outer covering integuments; and in the latter a central cellular pith, (medulla) a series of alternating rays, and an exterior integument.

"6. Here, then, we have the *origin of Pith* in the central cellular tissue of the stem, of *wood* in the woody axis, of *bark* in the cellular integuments, and of *medullary processes* in the radiated passages of cellular tissue connecting the centre with the circumference."

Our extracts are faithful to the minutest point of theory, though not precisely literal; and we are not aware of any description better calculated to convey a correct idea of observable facts, always, however, with the admission that nature "sports," and is not tied down to preciseness of conformation.

We make no allusions to the functions of the "organism" in this place, nor can we, to do the subjects justice, enter into a description of the other classes of stems; but it is essential to attend minutely to the first remark of No. 6—"Here, then, we have the *origin of Pith*," because it involves two opposing theories.

Many writers, Du Hamel among others, conceived that the *medullary* rays originated in the *Pith*. Dr. Keith repudiated the idea, and adduced the authority of the late Mr. Knight, which instructs us that in tracing the operation of budding he observed that the wood formed under the bark of the inserted bud, unites indeed confusedly with the stock, though still possessing the character and properties of the wood from which it was taken, and exhibiting divergent *layers of new formation*, which originate evidently in the *bark*, and terminate at the line of union between the graft and stock. Mr. Knight stated these facts, many years since, in the *Philosophical Transactions;* but he recurred to them not long before his decease, and thus expressed his conviction:—

"The medullary processes are formed convergently from the bark—they are permeable to fluids; for when the bark is taken off in the spring, a fluid is seen to exude from them, which, under favourable circumstances, will become *perfect bark.* When the bark remains on, and is performing its natural office, I entertain no doubt but that those processes are the *anastomosing* vessels of the vegetable world, which carry such a portion of the sap that has descended down the bark, and is not expended in affording the matter of the new layer of wood, inwardly, to join the alburnous current."

If this view be correct, we might presume that the *Bark* is the origin of *the rays* if not of the *Pith.*

Let any one investigate a green, but perfectly-formed shoot of elder, at the period when its first year's growth is complete. By making carefully a longitudinal and cross section, the Pith, its surrounding sheath, cellular and fibrous tissues, and external integument, will be traceable; but, perhaps, upon mature reflection, and by comparing a variety of observations during the course of growth, it will appear rational to conclude that *all the parts have been* developed simultaneously, as accessories one to the other, and, therefore, that growth and enlargement, which render visible what had been hidden, though pre-existent, are processes dependent solely on nutrition, under the exciting stimulus of solar light.

ON GROWING CLIMBERS AND OTHER TALL PLANTS AS BUSHES.

In a recent paper, we attempted to establish the desirableness of converting dwarf plants into Standards, by artificial means, and to prove that standard specimens were interesting as objects of curiosity, that they might be made useful for promoting convenience, and that, if their proportions be duly regulated, they are in the most rigid and refined sense ornamental.

We have now to advocate the adoption of a practice which may be considered directly opposite to that just mentioned, but which, however singular the fact may seem, is to be authorized, in great part, by the same principles to which we appealed in support of the former system.

That two seemingly opposed practices should be made to spring out of one essential principle, is not so paradoxical as a first glance would lead us to suppose. It is quite compatible with the truth of a principle that it should be developed in a multitude of forms; and that these forms, though widely different in their aspect, should bear a common relation to each other as respects both their source and their constituent elements.

The principle, however, to which we now refer, and the mention of which will best elucidate the above position, is that love of novelty which reigns in the human mind, and the endless search after variety in which it is engaged. To gratify this thirst, as we have before said, when it is only rationally indulged, all the ingenuity of the cultivator should be brought into action; and while the propensity may be ministered to by the production of standard plants out of those which are commonly of humble growth and different proportions, it may also be met by reducing taller plants to a state of dwarfness and bushiness which will derive most of its attraction from the fact of its not being their ordinary condition.

It were unnecessary to expend many words in justifying any process which introduces variety and freshness to a garden scene, whether in the plant-house or the open plot, without violating any rule of taste. Every change that does not entail much expense and trouble, and which brings with it an obvious air of novelty, is unquestionably an improvement, if it accomplish the object merely as well as the system for which it is substituted. This we hold as a fundamental truth; and one whose bearing upon all gardening operations that have to do with appearance alone, is of the most extensive and important description.

But when an altered mode of procedure does not break up any long-adopted plans, nor interfere with settled practices, and is simply the addition of a new feature to the garden scenery, its claims are placed on a still stronger basis. It then becomes additionally desirable.

Such is the case with respect both to the methods of making dwarf plants into standards, and tall growing specimens into bushes. It is not proposed to give these a universal application, or to subvert entirely the ordinary and natural modes of treating such plants. It is merely suggested that, by the limited adoption of the plans now indicated, a class of subjects would be obtained in our pleasure gardens and plant-houses, totally different from any now seen there, and in just sufficient numbers to render their appearance striking, without at all, or but very slightly, reducing the quantity of those at present grown there in the usual way.

Like the question we had formerly to discuss, however, the plan of forming tall plants into dwarf ones does not resolve itself into a mere matter of curiosity. It may be alike introduced on the grounds of convenience and ornament.

As a subject of convenience, its merits will be almost too palpable to require naming. To reduce a large plant into a small compass is often a matter of great moment in both large and contracted collections. And many a good species has to be omitted from a plant-house or a border, because it would occupy too much space. With climbers, again, which comprise some of the most beautiful of plants, it is frequently deemed impossible to grow them, because they cannot be kept in a pot of moderate size, nor trained within given limits. But the system we are recommending would render this a thing of easy accomplishment.

Another consideration regarding climbers sometimes operates against their being much cultivated; and this is, that, both in the open ground and in houses, they demand trellises or stakes to support them, and a good deal of training. By keeping them in a dwarf and bushy condition, however, these circumstances would be avoided.

In an ornamental point of view, again, the subject assumes further interest. And it is in this light that we would particularly seek to place it, because, whatever arguments may be urged for or against any system, we conceive that, if they compromise the appearance of the object, they at once become questionable; whereas, convenience, economy, and nearly everything else, may be in some degree sacrificed to gain a superior ornamental aspect.

There is probably much of difficulty connected with the inquiry whether such plants as Climbers—in themselves among the most elegant of the vegetable tribes—can have their attractions at all increased by any treatment that takes away their natural character. The native gracefulness of this tribe, wild and irregular though it be, is perhaps incapable of enhancement by being reduced within any of the rules of art. Still, as hardly any cultivated Climbers are treated naturally, but are all to some extent pruned and trained, there will be the less objection to a decided interference with their habits; while, as the method we are propounding will secure a large measure of symmetry, which is in itself one of the most genuine elements of true beauty, any such objection will be yet more diminished in its force.

The most cogent reason, however, in favour of our plan, regarded as a question of ornament, is deduced from a law which, we think, will be universally subscribed to concerning blooming plants. It is that, if two specimens be alike healthy, well-proportioned, and of the same size, the one which produces the greatest number of flowers is the most emphatically ornamental. The largest proportion of flowers, then, in the same space, other conditions being correspondingly favourable, is our criterion of genuine showiness; and keeping this test before us, we may observe that, by restricting the extension of climbers or other tall plants, and transforming them into low bushes, their blooming propensities will be augmented, and an increased amount of flowers being thus compressed into a much smaller compass, the effect of the whole will be more splendid and commanding.

We have gone thus minutely into the details of our proof that the system under notice is entitled to adoption, because, without such explicit and specific evidence, it might be denounced as an unnecessary and useless innovation. And we have taken up each point separately, and on its own distinct merits, that, by accumulating the proof derivable from each, we may construct altogether a more stable and convincing argument.

It is proper that we now speak of the manner in which the plan we are discussing is to be effected, and the plants on which it can most suitably be practised. We shall not employ much of our space for this purpose; our aim being rather to evince the propriety and usefulness of the system, and give some hints for its general effectuation, than to descend into those practical minutiæ with which the most ordinary cultivator must be familiar.

One of the principal—indeed, almost the only—way in which we would endeavour to bring about the ends contemplated, is by repeated, judicious, and energetic pruning. This, as a means of improving upon the modes of cultivation most in vogue, has by no means obtained its due prominence. To produce in any climbing or rambling plant a dwarfness, symmetry, and branching character, no method can be so effective as pruning, provided always that the plant be susceptible of amelioration by such means.

To prune a Climber or a straggling plant of any description into a low and compact state, it is indispensable that the operation be begun early. As a shoot can only be trained nicely in a given position, by a due and *timely* attention to securing it in that position, so, more peculiarly, a plant can alone be made to assume a particular shape by commencing the means of giving it that shape while it is yet very young, and before it has taken another form. Pruning should therefore be resorted to upon the first or leading shoot, and at the end of its first year's growth.

But early pruning will be of no use in such a case, unless it be vigorously continued. Prune frequently, must be as much the cultivator's motto, as prune soon. The latter is necessary to educe lateral shoots, in sufficient abundance, and sufficiently near the base of the plant. Yet the former must be adhered to, as the sole way of multiplying the number of those lateral shoots, and relieving that degree of dwarfness which may have been commenced. Nor should this subsequent pruning be confined to the winter season. In reference to tender exotics, it should be repeated several times in the same summer, where the plants will admit of its being done; and even the hardiest species, whose shoots are at all disposed to ramble, may have those shoots stopped once or even twice in the progress of their growth.

Prune closely, is still another maxim which must be strictly enjoined. Early pruning and repeated pruning will be of comparatively little value, without hard pruning. The shoots—at least where the operation is a winter one, and during the two or three first years of the plant's advancement—should be cut down to within two or three inches of the old wood, as their nature may demand or justify; for it is solely by this close reduction that the desired compactness and profusion of laterals can be realized.

That the shoots should be pruned down to a bud or eye—that a sharp knife should be used for the purpose in all cases—and that where the branches are small and tender, or the laterals scanty, or the growth exceedingly luxuriant, greater rigour should be exercised in the process—are directions which may just be alluded to, and of which all will perceive and appreciate the propriety.

A second manner in which dwarfness may be ensured or assisted, is by greatly cramping the roots of the plants. The old Chinese fashion will furnish an idea of this. Miniature trees, of eighteen inches or two feet in height, can be obtained by this mode; and, consequently, tall-growing plants must necessarily be capable of a similar reduction in height and other dimensions. The practice must, however, be carried to a very great extent, and will be of only little use unless accompanied by the employment of a poor soil. With this auxiliary, it may be adopted in a few instances with success.

For realizing, however, the true and best advantages which this practice is calculated to impart, it should be combined with that of pruning; for, by itself, it will certainly effect the object to a greater or less degree, but it will do so at the expense of the inflorescence. Not that it will diminish the quantity of the latter; it will only lessen its size. When united with pruning, and not pursued to an extreme, it will be highly beneficial.

Nevertheless, when we speak of confining the roots of plants, we are not to be understood according to the common sense of the phrase. As generally employed, it means that the diameter of the pots in which they are usually grown should be small; whereas, we intend that those pots should be peculiarly *shallow*. By this means, additional fertility will be gained, while a check will be given to the plant's growth at the same time.

The last method we shall notice for inducing dwarfness, refers almost exclusively to Climbers. It is by layering their shoots all around the parent stem, and rearing thus a thicket of small independent plants, which, though they will have roots of their own, will also, by retaining their connexion with the old stock, remain dwarf and flower beautifully. By selecting appropriate subjects for this treatment, and giving the benefit of pruning in addition, very noble bushes might be obtained for the shrubbery borders or flower-beds.

This plan is, moreover, adapted for some kinds of tall shrubs, or for usually dwarf objects, that have from any cause become straggling. We have seen evergreens, such as Rhododendrons and Laurels, immensely improved by it.

Were we, in closing this article, to supply a list of those plants to which we think our remarks most fitly apply, we should have to fill two or three pages with a catalogue, which, after all, would be necessarily incomplete; and which any one may make out for themselves from the general characteristics we intend furnishing.

Climbers, of nearly every class, hardy, greenhouse, and stove, might be most aptly treated in the manner we have sketched; and either or all of the three modes of operation pointed out applied to them, as their character may warrant. Of hardy ones, we may name, as illustrations, several species of Clematis, Honeysuckle, Jasmine, and *Wistaria sinensis;* while Thunbergias, *Poivrea coccinea*, *Tecoma grandiflora*, various Jasmines, and probably *Stephanotis floribunda*, and *Allamanda cathartica*, may be ranked among the more tender kinds.

Of shrubs that are straggling, or apt to become so, and may be rendered closer by either of the methods proposed, besides Rhododendrons and Laurels, we may single out *Cydonia japonica*, Roses, Spericus, Lilacs, Guelder Roses, Syringas, &c., which may be kept almost as small as desired; with *Hovea Celsii*, *Euphorbia* *splendens*, *Rondeletia odorata*, and a vast quantity of other exotics, both stove and greenhouse.

Let it not be thought we give these as even the most striking examples. They are selected at random; and we may affirm that there are few plants of a like character which might not be rendered particularly interesting by the treatment we have described.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR DECEMBER, JANUARY, AND FEBRUARY.

A'NIA BICO'RNIS. The Rev. J. Clowes, of Broughton Hall, near Manchester, furnished specimens of this terrestrial Orchidaceous plant, which he received from Ceylon, and flowered in March, 1842. "It belongs to a little group of the Epidendrous section, of which *Bletia* is the type; and is nearly allied to *A. latifolia*, a Sylhet plant, at present only known from dried specimens: from that it differs in having much smaller flowers and leaves, an entirely different labellum, and a two-celled anther—that of *A. latifolia* being eight-celled. In the latter circumstance, indeed, it corresponds with the neighbouring genus, *Cytheris*, whose distinctive character is, therefore, not to be taken from the cells of the anthers, but from its resupinate flowers, and truly calcarate labellum. In *Ania*, the labellum, if it appears to have a spur, as in *A. angustifolia*, owes that appearance to the extension of the foot of the column. At first sight, this plant, when in flower, resembles a starved specimen of *Eulophia macrostachya*." *Bot. Reg.* 8.

CE'REUS EXTE'NSUS. "This has long been cultivated in the Royal Botanic Gardens of Kew, but had never flowered there, nor was its native country known to any one, till, in August, 1843, J. Gray, Esq., of Greenock, sent the splendid specimen represented, taken from a plant he had received from Trinidad; thus, at the same time, establishing its native country, and giving the opportunity of making so fine a blossom known to the botanical world by a good figure. How needful such figures are, is but too apparent from the confusion of synonymes, in cases where we have only recourse left to descriptions. Professor De Candolle, who takes up this species from the Prince de Salm Dyck's letter, doubts if it be not a variety of his previous species, *C. coccineus*; but the *C. coccineus* of De Candolle, strange to say, is nevertheless by Pfeiffer made a variety of the *setaceus* of Salm Dyck; while the *C. coccineus* of Salm Dyck is placed in a different division, and retained as quite a distinct species by Pfeiffer. This seems to be a very shy-flowering species; and, if we consider the size and colour of the blossoms, one of the handsomest of this remarkable genus." It is described as a creeping, and probably a climbing species, with very long and comparatively slender joints, which have little wiry roots proceeding from them. The corolla is very large, with the "tube green, moderately long, cylindrical, swollen below, beset with rather distant scales, which are large, triangular, or ovate, greenish-yellow, tipped and margined with red, then gradually become larger upwards and longer, insensibly passing into the sepals, and then again almost as insensibly become the oblongo-obovate, acute, rose-coloured petals." It is a good deal like that of *C. grandiflorus*, except in colour. *Bot. Mag.* 4066.

CRI'NUM VARIA'BILE, *var.* RO'SEUM. "This beautiful bulb flowered in April last, with J. H. Slater, Esq., of Newick Park, near Uckfield. Its leaves are very long, and its gay rosy flowers most agreeably scented. Upon showing the drawing to the Dean of Manchester, the learned investigator of this difficult genus, he suggested the probability of its being either a variety of *Crinum variabile*, or a mule from *C. capense*, of which the gardens now contain so many. A reference to the published figures of the former induces us to regard it as one of its varieties, with which it agrees in its bright green very long leaves, and comparatively short scape." The following is Mr. Herbert's memorandum, in his work, concerning *C. variabile*. "This is the hardiest of known species; out of doors it preserves its leaves in winter longer than *C. capense*, and it shoots earlier in the spring. Both this plant and *C. revolutum*, have a slender germen; but the idea conceived from Jacquin's plate by some persons, of its cells being monospermous, was erroneous. Its leaves are deep green. The flowers turn to a rich purplish red, so that flowers of two colours are always on the same umbel." *Bot. Reg.* 9.

Geni'sta virga'ta. "The plant from which the figure was taken was received from Mr. Young, nurseryman, Milford, in July, 1843. He states that it is a very handsome compact shrub, which resisted the hard winter of 1836-7. It was raised from the seeds sent by Mr. Webb from Madeira in 1825, was turned out in 1833 in the open border, and is now a very woody shrub. It is deserving a place in all shrubberies. In the garden of the Horticultural Society it grows about four feet high, and is capable of enduring the ordinary winters round London, if placed in a dry situation, and planted in a loamy soil. It is increased by seeds, or by cuttings of the young wood after Midsummer. The cuttings should be placed in a shady situation, in light sandy soil, and covered with a hand-glass. It grows freely in May and June, and forms a loose rather spreading bush, rather thin of foliage. In the nurseries, it is generally known by the name of *Spartium virgatum*." *Bot. Reg.* 11.

Ipomœ'a cra'ssipes. "Among the many handsome plants being collected by Mr. Burke in his extended journey into the interior of Southern Africa, may be mentioned several Convolvulaceæ; and of these he was so fortunate as to bring seeds, which have been reared by Mr. Jenkins [Jennings], gardener to the Earl of Derby, at Knowsley. The present is one among them, which flowered in August, 1843; and being, so far as can be found, perfectly new, is named from the peculiarity of having the peduncle thickened upwards. It inhabits the elevated country about Macalisberg." The plant is a somewhat slender climber, with oblong-lanceolate, acute leaves, and purplish corollas. It is covered with short soft hairs in every part, save the corolla. *Bot. Mag.* 4068.

Lissochi'lus ro'seus. "Although the terrestrial Orchidaceæ of hot countries are too often very inferior to the epiphytes, yet there are many exceptions to that rule, among which few are more striking than the present, which will not suffer by comparison with the Vandas, and Saccolabiums, and Dendrobiums of India. It is a native of Sierra Leone, whence it was received by Mr. Rucker, in whose magnificent collection of Orchidaceæ it flowered in February, 1843. The leaves are broad, stiff, and plaited like a reed; the flower-stem is between four and five feet high. The petals are of the brightest rose-colour, set off with velvety-brown sepals, and a yellowish stain on the lip. There is another plant in the same part of Africa, which would, perhaps, excel even this in beauty; and it is much to be regretted that no one should have yet been able to send it home. Its petals, even dried, are an inch and a half long. Sir William Hooker has a specimen in his herbarium, collected near Boney, which Dr. Lindley named, some years ago, *Lissochilus macranthus*." *Bot. Reg.* 12.

Lupi'nus arve'nsis. "A gay little plant, forming one more addition to the large genus *Lupinus*. The flowers are rich bright lilac, enlivened by a yellow spot on the white centre of the vexillum. In number, the leaflets vary from five to nine. The seeds, by which Lupines may be distinguished more accurately than by the ordinary marks employed by botanists, are oblong, smooth, and mottled with gray of different tints. It is a half-hardy biennial, growing from one to two feet high, and flowering a great part of the summer and autumn. Like other Lupines, it requires a strong rich soil, and although a half-shrubby biennial, is best treated as an annual. The seeds should be sown about the beginning of March, in pans filled with a loamy soil, and, when large enough, should be potted, placing three plants in a small pot; afterwards, when the danger of the late spring frosts is over, they may be planted out in the open border. The seeds may also be sown in the open border about the middle of April; but then the plants flower much later, and are never so fine as when treated as above stated. It was found growing in corn-fields, near Loxa, in Peru, by Mr. Hartweg, and flowered in the gardens of the Horticultural Society in the course of last autumn." *Bot. Reg.* 1.

Rhodode'ndron Apri'lis. "A beautiful hybrid, raised by the Hon. and Very Rev. the Dean of Manchester, from seed of *Rhododendron ponticum*, fertilized by the Davurian Rhododendron. It flowers in April; for which reason Mr. Herbert has given it the name of *Aprilis*." It has, apparently, a neat habit, and bears dense heads of flowers, which are whitish in the centre, and bright pink towards the outside, with shading and dark spots on the upper petals. "Of course, a hardy shrub: but we believe not at present in the hands of the trade." *Bot. Reg.* 62.

Saxifra'ga cilia'ta. "This plant, of the section Berginea, and very nearly allied to *S. ligulata*, is, like that species, a native of the mountains of Northern India." Dr. Royle says it is "found on the Mussoree and Duen Range, at lower elevations than *S. ligulata*. The leaves are ovate and obtuse at both ends, extremely hairy on both, but especially the under surface and along the nerves; the peduncle is slender; the inflorescence an erect, but lax-spreading panicle; the calyx gamosepalous, and cup-shaped at the base, and consequently less deeply divided than in *S. ligulata*, with the laciniæ entire, and not ciliate, and the petals more unguiculate." "It must be confessed," adds Dr. Lindley, "that the plant now represented does not agree altogether with this description; in particular, it wants the hairiness of the leaves spoken of by Dr. Royle: but we ascribe this difference to cultivation. In fact, the plant in the Garden of the Horticultural Society, from whence the drawing was made in March, 1843, was raised from seeds sent under the name of *S. ciliata*, from the Botanical Garden at Saharunpur. We must remark, that Dr. Walpers has a second *S. ciliata*, from India; the latter being *S. imbricata* of Royle. *S. ciliata* is a robust hardy perennial, requiring the same soil and treatment as *S. crassifolia;* but when planted in the open border, it must not have a situation which is damp in winter, or fully exposed to the sun in summer. It is easily increased by dividing the old plants; or by seeds, which should be sown when ripe in pots filled with sandy peat and a small portion of loam. It flowers about May, in the open border." *Bot. Reg.* 65.

Spiræ'a reevesia'na. "This plant, which was introduced from China by Mr. Reeves, whose name it bears, is generally supposed to be the *S. lanceolata* of Poiret: but that species is described with axillary sessile umbels, and must therefore be different. It is certainly Roxburgh's *S. corymbosa*, a name, however, which, being preoccupied by Rafinesque, cannot well be retained. Probably, it is also the No. 701 of Dr. Wallich's Indian Herbarium, and if so, may be a native of the mountains of India, as Dr. Roxburgh states. The leaves on its strong young shoots are so deeply lobed as to be almost pinnatifid. On the branches, when the plant is young, they are frequently three-lobed; but as it becomes old, they lose their lobed character altogether. It is a handsome hardy sub-evergreen shrub, growing in any good garden soil, from three to four feet high. It is easily increased from cuttings of the small half-ripened twigs, any time during the summer or autumn. The cuttings should be put in sand, and covered with a bell glass, and placed in an exhausted dung frame. It forms a spreading bush, and flowers freely in May and June. It probably would be quite evergreen in the warmer parts of England." The flowers are white, and collected into terminal heads. *Bot. Reg.* 10.

Sta'tice rytidophy'lla. "A very beautiful species of *Statice*, and easily cultivated as a hardy greenhouse plant; but of its history, I regret to say, I can get no satisfactory information. The Royal Botanic Gardens of Kew are indebted for the possession of it to Mr. Low, of Clapton; and it exists in several gardens under the name of *S. Dicksoniana* [*S. Dickensoniana*]. Mr. Mackay, of Dublin, informs me," writes Sir W. J. Hooker, "that he has raised it from South African seeds, given him by Mr. Harvey, and that he understood it to come from Port Natal. But I find nothing of the kind among my own specimens from that part of the country; and although Mr. Harvey is aware that he brought to Mr. Mackay seeds from the Cape of Good Hope, he had no reason to suppose that the collection contained any from so distant a region as Port Natal. Respecting its native country and introduction we must still remain in doubt; but there can be no question about the beauty of the species, or its merit as a standard plant for cultivation." As it had become so familiar by the name of *S. Dickensoni*, in consequence of having first flowered with Mr. Dickenson, a provincial nurseryman, we can hardly see the propriety of giving it a fresh appellation. *Bot. Mag.* 4055.

Stigmaphy'llon jatrophæfo'lium. "According to M. Auguste de St. Hilaire this little plant is an inhabitant of rocky places near the foot of Salto, on the banks of the Uruguay, in the province of Rio Grande do Sul, where it creeps over the surface of the soil. The figure was taken from a fresh branch, sent, last July, anonymously from Liverpool, to the Editors of the *Gardeners' Chronicle*. We, therefore, conclude that it will soon make its appearance in the collections round London. No doubt it will be a very pretty twiner, well suited for cultivation in pots attached to trellis. Its leaves are a clear light green, and beautifully cut; it appears, however, that they are sometimes heart-shaped and undivided. The whole genus is worth cultivation, and some of the species are extremely handsome. They amount to forty-five, according to M. Adrien Jussieu, and are found in most of the warmer parts of South America, especially Brazil. Some of them are Banisterias of authors. Of the cultivation of this plant we can, of course, know nothing certain. It is, however, probable, that it will prove suited to a greenhouse; but as it is found trailing among stones, it will no doubt require full exposure to all the sunlight that can be obtained in this climate. Probably the treatment given to melons will suit it during summer. We should add, however, that the correspondent who sent it states, that it is a free flowerer, growing luxuriantly in a moist stove." *Bot. Reg.* 7.

Turræ̀a lobà̀ta. " This very rare stove plant flowered at Chiswick House last July. His Grace the Duke of Devonshire received it from Mr. Whitfield, who collected it in Sierra Leone. The flowers have much the appearance of those of the Orange, but have no smell. The nearest affinity of this plant is evidently with the *T. heterophylla* of Smith, a species from the same country, and apparently very like it. But Mr. Bennett, in his revision of the genus in Horsfield's *Plantæ Javanicæ*, places *T. heterophylla* in a section having from ten to twenty cells to the ovary; this, however, has most certainly only five cells, with two ovules in each. The stamens are formed into a tube, and the head of the style is club-shaped, with five stigmas projecting beyond it. The twenty awl-shaped reflexed teeth, which form a kind of coronet to this tube, stand in pairs between the ten anthers, and are apparently lateral processes of the stamens, one of each pair belonging to a different stamen. There is something very singular in the *placentæ, which are densely covered with entangled twisted jointed hairs*, the nature and use of which require further examination." The plant appears to be a dwarf evergreen shrub, with three-lobed and toothed leaves, and pure white flowers. *Bot. Reg.* 4.

NEW OR INTERESTING PLANTS FLOWERING IN THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

Begònia manicà̀ta. A very profuse flowering species, growing two or three feet high, with fine broad shining foliage. The flowers are borne in rather diffuse panicles, and are of a pale pink hue, with a deeper tint at the margin of the petals. It is remarkable for the fringed edges of the leaves, and the crimson setaceous appendages that surround the upper part of the leaf-stalk. It seems to delight in a rather moist atmosphere. Specimens are flowering in the stoves of Mr. Knight, of Chelsea, and Messrs. Loddiges, of Hackney, as well as in several of the suburban gardens.

Coleonè̀ma tenuifò̀lia. This is a neat and elegant greenhouse plant; and, though its flowers are small, and, when viewed singly, are far from being showy, yet as they are borne profusely, and near the extremity of the shoots, they are by no means void of attraction. They are of a pink hue when first expanded, but afterwards become paler; a circumstance which rather increases than detracts from their effect, as the plants are continually developing new blossoms throughout the spring months, and thus presenting a greater variety of tint. The branches are very slender, but sufficiently rigid and numerous to preserve a shrubby and compact habit. As the name implies, the leaves are narrow and tenuous, and give the plant something of a heath-like appearance. We saw it at Mrs. Lawrence's, of Ealing Park, where an excellent specimen is just beginning to expand its blossoms. Being a species which throws out an abundance of roots, it requires plenty of pot-room, and a liberal supply of water during the growing season, to maintain it in a vigorous condition.

Cyrtochì̀lum maculà̀tum, *var.* A superior variety of this species is blooming at Mrs. Lawrence's. The colours of the flowers are more distinctly marked, and clearer and brighter than in the original species. It does not appear to differ in the magnitude of the blossoms, but the spikes we saw were shorter and less vigorous: possibly, however, this may not be general.

Dendrò̀bium linguæfó̀rme. We notice this plant, which has been in the country a few years, not so much for the beauty of its blossoms individually, as for their showy appearance in the mass. It belongs to the same section of the genus as *D. calamifórme*, but is much more robust in habit. The leaves are very thick and fleshy, and, as the name indicates, are formed like a tongue. They are produced on a creeping stem, which also emits an abundance of roots from its lower surface. The flower spikes are erect, rising three or four inches, and bearing a profusion of small, narrow, pointed, white flowers, which are expanded successively, and remain in perfection for a long time. Messrs. Loddiges of Hackney, have several plants in bloom in a cool house, and upon one of these we counted upwards of twenty spikes. The chief merit of the species consists in its producing blossoms during the winter months, when every flower is so desirable, and requiring little heat to enable it to flourish. A close greenhouse seems to suit it exceedingly well ; and, suspended in a flat basket containing a little moss, or attached to a block of wood, or a piece of freestone, it will be useful for creating variety.

Epa′cris varia′bilis. Few plants are more ornamental than this when full of its pretty rose-coloured blossoms, depending in long lines from the numerous spreading branches. It bears a considerable resemblance to *E. campanulata rubra*, both in habit and in the hue of its flowers, but differs from that variety in the greater length of the tube. A fine plant is now a conspicuous object in one of the greenhouses at Ealing Park.

Ne′ottia specio′sa. The terrestrial species of Orchidaceæ appear to be little regarded by the generality of cultivators ; many, however, when well grown, are quite as worthy of attention as the epiphytal section. Several plants of the present showy kind are in bloom at the Exotic Nursery of Mr. Knight, at Chelsea. It throws up strong spikes of crimson and salmon-coloured flowers, which, from being elevated so much above the foliage, appear to great advantage.

Rue′llia isophy′lla. Mr. Lee, of Hammersmith, has specimens of this species in flower in one of his stoves. The appearance of the plant, in its general features, does not differ widely from the old *R. persicifolia*. It is, however, a little more bushy and compact, and the leaves are narrower at the base, and of a deeper green. It grows very luxuriantly in a moist stove ; but in a warm greenhouse it flowers with greater freedom.

Styphe′lia tubiflo′ra. An old species, introduced about forty years ago from New South Wales. When well-grown and flowering freely, it is a very desirable plant, and well deserving of more extensive cultivation. It has much of the habit of an *Epacris* (to which genus it is nearly allied) ; and it bears a great resemblance, in its long, tubular, delicately-coloured blossoms, to *E. grandiflora*. The tube is nearly white at the base, gradually deepening to a rich crimson towards the top. The limb is rolled back, and fringed with crimson hairs. Young plants succeed best in a pit or frame, where abundance of air can be afforded to them.

OPERATIONS FOR MARCH.

At this period of the year, when nature is beginning to shake off her wintry torpor, and to put forth her endless variety of beautiful aspects, the gardener should manifest equal energy, and set about putting every part of his floricultural department in proper order. The delay of a week or a fortnight in the performance of certain operations that may have been left undone hitherto, or that require dispatch, may send its paralyzing influence throughout the entire season, and frustrate what might otherwise have been the most perfect arrangements.

This is particularly the case in respect to potting exotic plants, to pruning flowering shrubs in the open air, to the propagation of half-hardy perennials for the flower-garden, to sowing several kinds of seeds, and to the completion of new ground-work.

With respect to potting plants, although we have often had to enforce the propriety of deferring it to suit individual cases, and not making one, or even two, general shifts ; and although the force of such a suggestion is unquestionable, there is a possibility that the plant-grower may carry the practice of late-shifting too far. All the appropriateness of the rule consists in giving each specimen a fresh shift just as it begins to grow ; and if this be not strictly accomplished, or the plant be left to make any considerable progress in its developments before it is shifted, an equal or greater evil than that resulting from too early potting will be experienced ; for the young wood will be impoverished, and acquire a weakliness which no after-culture will remove, except the shoots be cut away altogether, which will entail a great loss of time. The best period, then, for potting every plant (bulbs, perhaps, excepted) is precisely that at which the young shoots or buds commence developing themselves ; and if the operation be postponed for any length of time beyond this, injury will inevitably accrue.

Late pruning for shrubs in the open air, or, indeed, for any kind of shrubs that are cut only in winter, is objectionable on a somewhat similar principle to that above laid down with reference to potting. If the buds of any plant have begun to burst before it is pruned, the best vigour of the specimen will have to be cut away; since, as the upper buds of a shoot begin first to extend themselves, and draw away the supply from those at a lower portion of it, and as it is these upper buds which are removed by pruning, the whole shoot and its development will be rendered weakly when they are taken away. Besides, pruning after the sap has begun to flow, causes a loss of vital power, in consequence of the quantity of sap that must escape from the wound. At least, this is the case with respect to a general pruning. It is very injudicious, therefore, to leave the pruning of either trees or shrubs to so late a part of the season that, as we have thus shown, it cannot be done without entailing mischief. More especially would these observations apply to Roses, which many cultivators refrain from touching till frosts have ceased, because the action of frost on the severed portion of their shoots destroys its tissue. But, while such a rule may be good in relation to some of the kinds, the point at which it becomes prejudicial is when the shoots get two or three inches in length; and the time at which the pruner should interpose, is the commencement of any kind of general growth. Indeed, without pruning be done at this time, it had better not be attempted.

In the propagation of tender perennials, the cultivator must remember that the sooner he gets the required number of plants ready for transplanting into the flower-beds, the earlier and finer will be their display in the summer. If autumnal propagation has been preferred, the losses sustained throughout the winter will have to be made good; and where the increase has been left till spring, it should at once be commenced. Young plants that have stood in the cutting-pots all the winter, may now be potted off; and those which were reared in autumn, should have their growing shoots stopped. Between the present and the time of planting, in fact, the stopping of the shoots will be the principal point to attend to; for, unless this be regularly and systematically done, the plants will have to undergo a lengthened preparation after they have been put out in the beds, or they will always be straggling, unsightly, and deficient in flowers; whereas, they ought to be prepared for immediately beginning to bloom when they are transplanted.

It is probably needless to endeavour to support the statements that seed-sowing and ground-work, if protracted too long, will interfere materially with the beauty of the garden during summer. Seeds of all sorts of annuals should be put in forthwith; and not as a general sowing, which is to suffice for the entire year, but as part of a series of sowings which is to be carried on while there is any chance of securing flowers in the autumn, and even with a view to an early blooming in the ensuing spring. Here is the great error regarding annuals. Most cultivators sow but once, and then in large quantities, the result being an undue profusion at one particular period, and only an accidental supply afterwards. A smaller quantity, sown at several separate times, would yield a successive and constant exhibition.

Where it is possible, all ground-work should be completed this month. Wherever it is continued after this, and turf has to be laid, walks put in order, flowers planted, &c., there will usually be some blemish perceptible in it all the summer, unless the season be remarkably favourable. The carrying on of such operations, too, after flowers make their appearance, is inconsistent with that finished keeping which should be maintained in every garden, except where the proprietor is absent and does not require it.

The work to be done in plant-houses this month is multifarious and important. A large proportion of the plants will need re-potting, and others will want top-dressing. The roots of all should be examined, to see that they are in a healthy condition, and that the soil is adequately drained. When spring weather fairly sets in, the houses may be kept warmer, and the plants should have a larger amount of water. As soon as they start into vigorous growth, syringing may be freely practised, and where very bushy specimens are desired, the shoots must be kept properly stopped, according to the nature of the species. Camellias must now be carefully and regularly watered or they will shed their flower-buds without expanding them. Pelargoniums should be put in a house or frame with a temperature a little above that of a common greenhouse. Balsams, Cockscombs, &c., may be sown in a hot-bed frame. Dahlias can be started in a moist bottom-heat, and propagated as they form shoots. As fast as fit wood is developed on greenhouse and stove-shrubs, their propagation by cuttings can be carried on. And wherever there is a tendency to undue luxuriance, it should be kept in check by pruning, by watering sparingly, or by retaining the specimen in a comparatively small pot.

THE LATE MR. LOUDON.

THAT any man who has yielded up the best energies of his life to the advancement of an important science, and the promotion of the public welfare through his laborious writings, should close his days under the pressure of pecuniary engagements, and leave his family burdened with such embarrassments, is, though too commonly the case, an exceedingly lamentable circumstance. And every friend to humanity must regret that Mr. Loudon should have gone to his grave beneath a weight so truly depressing.

But other thoughts than those which busy themselves with the deceased, will arise in most minds of a healthy tone. And when we heard of the calamity which had befallen Mr. Loudon's household, and the uncertain tenure of what literary property remained to him, we at once issued a circular to solicit those who could appreciate real worth, and who were not possessed of Mr. Loudon's valuable publications, to purchase such of them as they could make most available, in order to relieve the rest from the obligations which had been incurred upon them.

We have now to tender our personal thanks to those who have already liberally responded to that request. At the same time, we trust that a far larger body of subscribers will yet come forward ; and, while they pay this tribute of respect to the departed author, enrich themselves with works which are identified with the history of gardening, and embody the highest known principles, practices, and facts, in relation to the art.

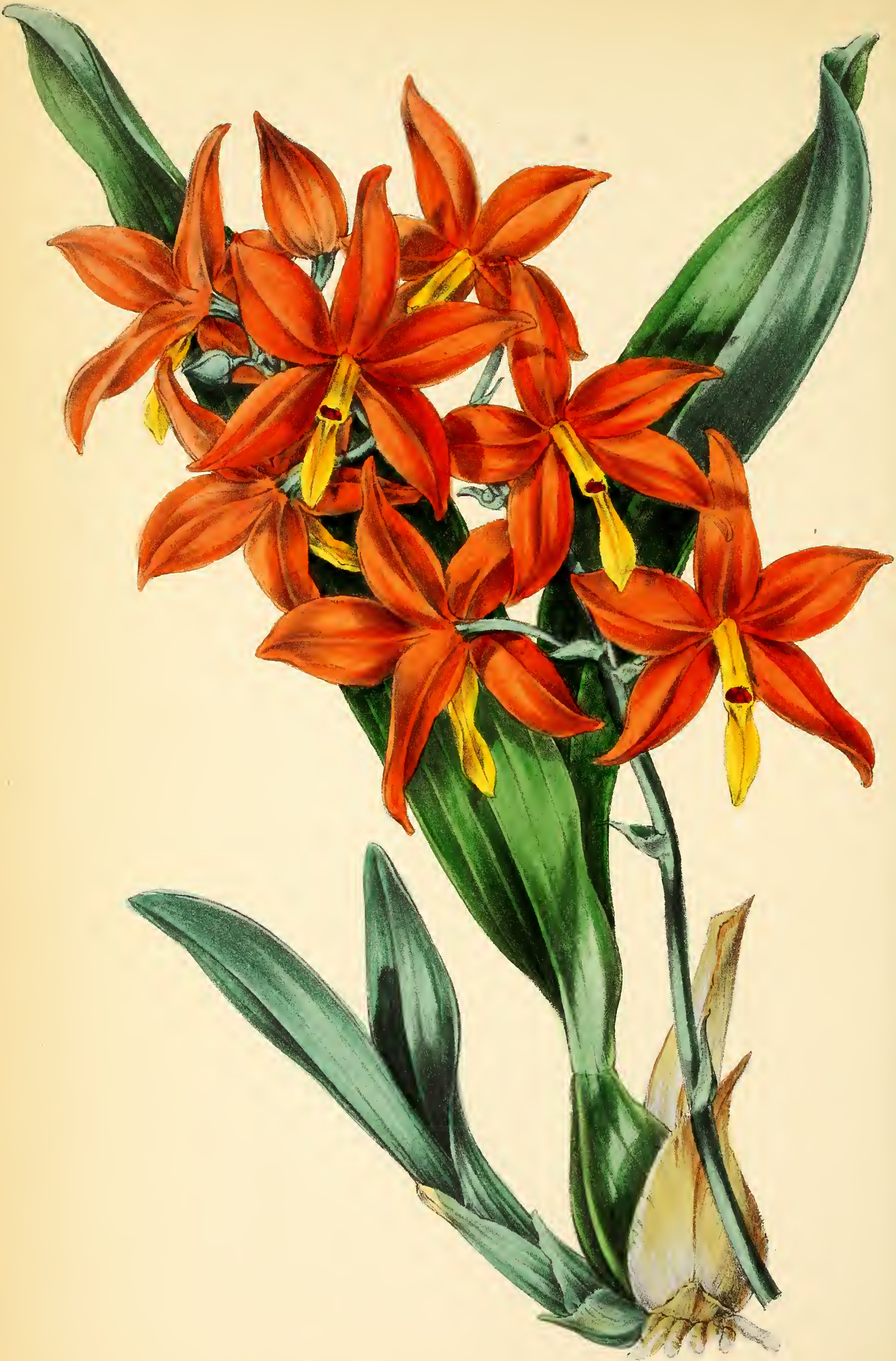
Lest, however, such a means of contribution should prove inadequate to rescue the copyright of Mr. Loudon's works from their present liabilities, it was arranged among his friends that a public meeting should be held at the Horticultural Society's Rooms, Regent Street, London, to consider and devise the fittest plans for further aiding his bereaved wife and daughter. That meeting took place on Saturday, the 17th of February, and was well attended by the friends of horticulture generally. The numbers present, and the whole of the proceedings, convey a vivid testimony of the esteem in which Mr. Loudon and his works are generally held, and the equal esteem and sympathy accorded to Mrs. Loudon.

A committee was also formed on this occasion, and resolutions passed to carry into the fullest possible effect the objects set forth in our circulars ; and there appears every prospect, not only of defraying the amount due upon some of Mr. Loudon's works, but also of respectably maintaining his family.

It was likewise resolved that subscriptions be received from any who further desire to testify their sense of Mr. Loudon's merits, and assist in accomplishing the intentions of his friends, but who may happen to have the principal part of his works. The names of such parties will be published in the *Gardeners' Chronicle*, along with those who purchase the works ; the subscription for the books being transmitted to Mrs. Loudon, Bayswater, and the other contributions to the Treasurer, J. Cook, Esq., 40, Mincing Lane, London.

To those who are acquainted with Mr. Loudon's character or productions, or with the excellent works of his talented wife, it will be needless that we make any additional plea. The cause of so eminent a gardening author, and that of all connected with horticulture, are one ; and they who feel this will want no other inducement to be liberal. But there is a large portion of our readers who move in the higher ranks of society ; and we must appeal to their benevolence, or rather to that honourable patronage of useful exertion which so nobly distinguishes the aristocracy of this country. Many a garden which Mr. Loudon has never visited has been immensely improved through the influence of his works ; and many a table enriched with previously unknown or additionally refined luxuries through the same medium.

Yet, after all that might be said, we should prefer leaving the matter to the spontaneous contributions of a community, which, however tardy it may occasionally be in lending its friendly aid to preserve *living* worth from penury, is always munificent in doing honour to the memory of its humblest benefactors, and conferring substantial tokens of its appreciation on their kindred.



S. Holden. del. & Lith.

Epidendrum vitellinum.

EPIDÉNDRUM VITELLÌNUM.

(Yolk of Egg coloured Epidendrum.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDÀCEÆ.

Generic Character. — *Sepals* spreading, nearly equal. *Petals* equal with the sepals, or narrower, rarely broader, spreading, or reflexed. *Labellum* wholly or partly united with the margin of the column; limb entire or divided, surface frequently ribbed or tuberculated. *Column* elongated, with a recurved margin, often fimbriated. *Anthers* two to four-celled, fleshy. *Pollen-masses* four.

Specific Character.—*Pseudo-bulbs* ovate, acuminate, two-leaved. *Leaves* oblong, strap-shaped, acute, with dry membranous sheaths at the base. *Raceme* terminal, erect, many-flowered, short. *Sepals* and *petals* ovate, lanceolate, acute, nearly equal, spreading. *Labellum* linear, with an abruptly narrowed, acute apex; base callose, pierced with two holes, half-free.

Among the vast number of species contained in the genus *Epidendrum*, it is natural that we should look for a considerable dissimilarity of form and of character, but the very different appearance of the more prominent features of some species, and even the variety displayed in the lineaments of the flowers, is so great, that to one unacquainted with the nice distinctions of botanists, they would scarcely be imagined to possess any affinity. And yet, these distinctions, minute and unobtrusive as they are, form the only sure and unvarying standard for arranging plants in collective groups.

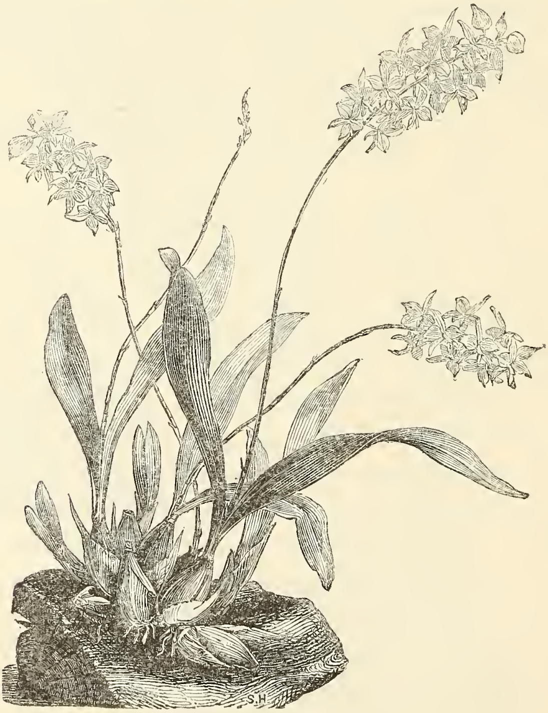
Perhaps the most prominent variation in the habits of Epidendra is to be found in the long leafy stems peculiar to many species, and the round pseudobulbous nature which characterizes others. And though many which have been introduced produce small and inconspicuous flowers, which are void of interest to the cultivator who looks for a showy bright colour to enliven his houses, there are yet others that, from the elegance and profusion of their blossoms, bespeak his admiration. A glance at the accompanying plate will best testify the title of the present species to be enumerated with the latter class. It is one of the pseudobulbous section, and has finer and broader foliage than is usual amongst them. From its kindred species it is readily recognised in the peculiar appearance communicated by the glaucous bloom which overspreads the leaves. Flowers are produced in tolerable profusion, and the plant seems likely to be a general favourite.

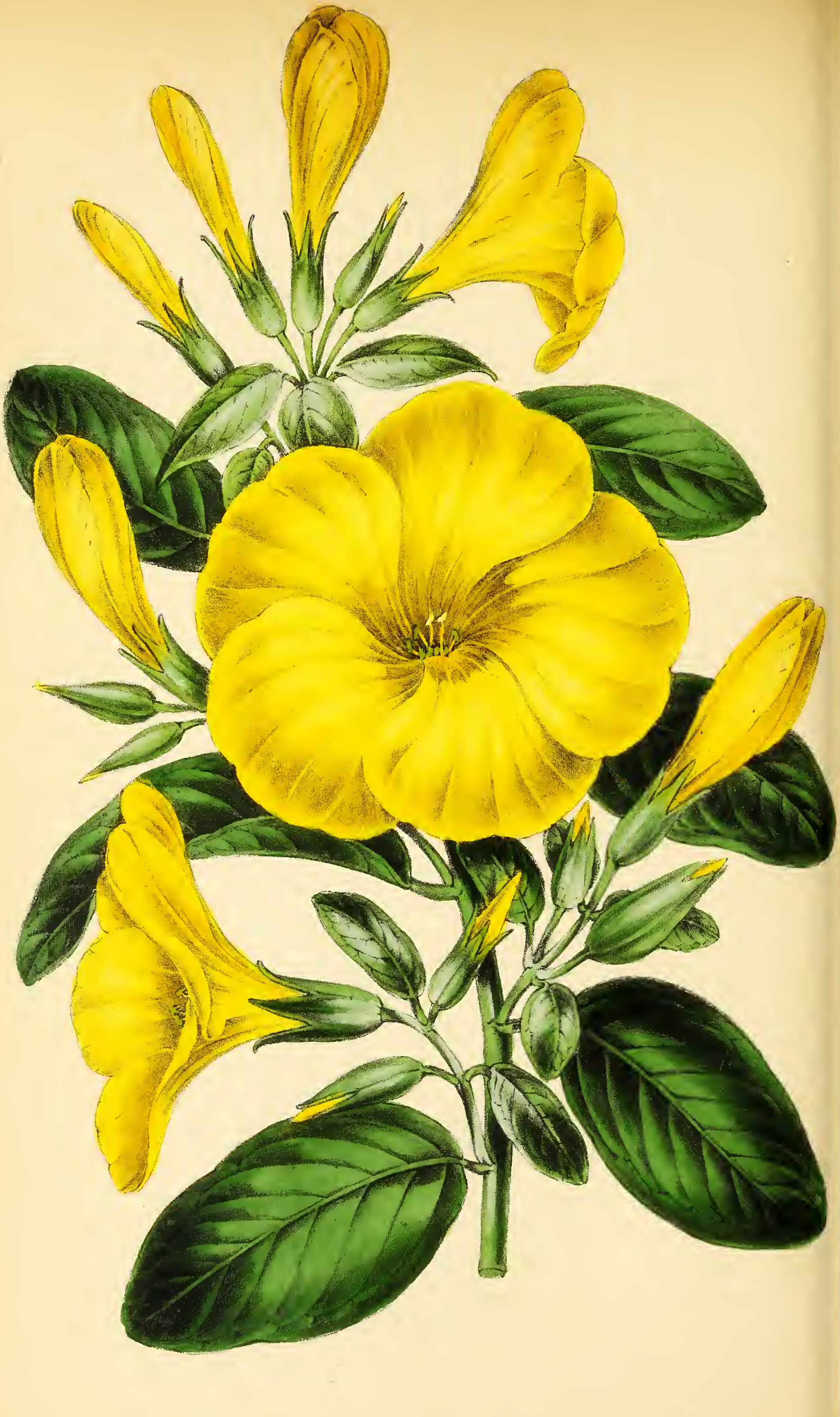
Writing about it in the Botanical Register, Dr. Lindley observes, " It was not till specimens collected on the Cumbre of Tetontepeque in Mexico, at the elevation of 9000 feet above the sea, were received from Mr. Hartweg, that I had any conception of the superb appearance of the plant. One of them now before me, has a spike covered with fifteen large orange-coloured blossoms, all expanded at once, over a space of more than six inches in length, and forming a most conspicuous object."

Our drawing was executed at the nursery of Messrs. Loddiges, of Hackney, in whose extensive collection of Orchidaceæ a specimen flowered last September. It was received from Oaxaca about four years ago.

The elevated situation in which it is found in its wild state, points out the propriety of growing it in a cool house. During the growing season, it delights in a humid atmosphere, carefully shaded from the direct rays of the sun by some thin slight substance. In the colder months of winter, when the plant is at rest, no more water should be administered than just sufficient to preserve the bulbs in a plump state. It appears to attain a greater degree of luxuriance when grown in a pot, with a compost of heath-soil of a loose texture, having some potsherds mixed up with it, than when attached to a block of wood. A few plants, however, might be so treated for the sake of variety in a large collection. If grown in a pot, the pseudo-bulbs should be raised an inch or two above the rim.

The specific name *vitellinum* appears to be given in allusion to the resemblance of the flowers in colour to the yolk of an egg.





S Holden del & Lith

Linum trigynum

LÌNUM TRIGÝNUM.

(Three-styled Flax.)

Class.
PENTANDRIA.

Order.
PENTAGYNIA.

Natural Order.
LINÀCEÆ.

Generic Character.—*Calyx* in five parts. *Corolla* consisting also of five entire portions, obtuse. *Filaments* generally five in number, rarely three. *Anthers* arrow-shaped. *Capsules* ten-celled.

Specific Character.—*Plant* suffruticose, growing from two to three feet high. *Stem* erect, smooth, pale green, slightly tinged with brown. *Leaves* alternate, entire, extipulate, oblong, acute, smooth. *Calyx* persistent, five-cleft; segments acute, pale yellowish-green, semi-transparent, streaked with purple. *Corolla* funnel-shaped. *Petals* five, bright orange-yellow, with numerous purple veins; throat of the tube deep orange. *Stamens* five, inserted in the base of the calyx, shorter than the tube of the corolla. *Pistils* three, larger than the stamens.

Seeds of this attractive species of *Linum* were received by Major Francis, Madden Hall, and, with many other seeds and bulbs, were presented to his brother, R. Hall, Esq., of Narrow Water House, Warren Point, Ireland, in whose stove it flowered about December, 1837, and to whose kindness we are indebted for the present figure.

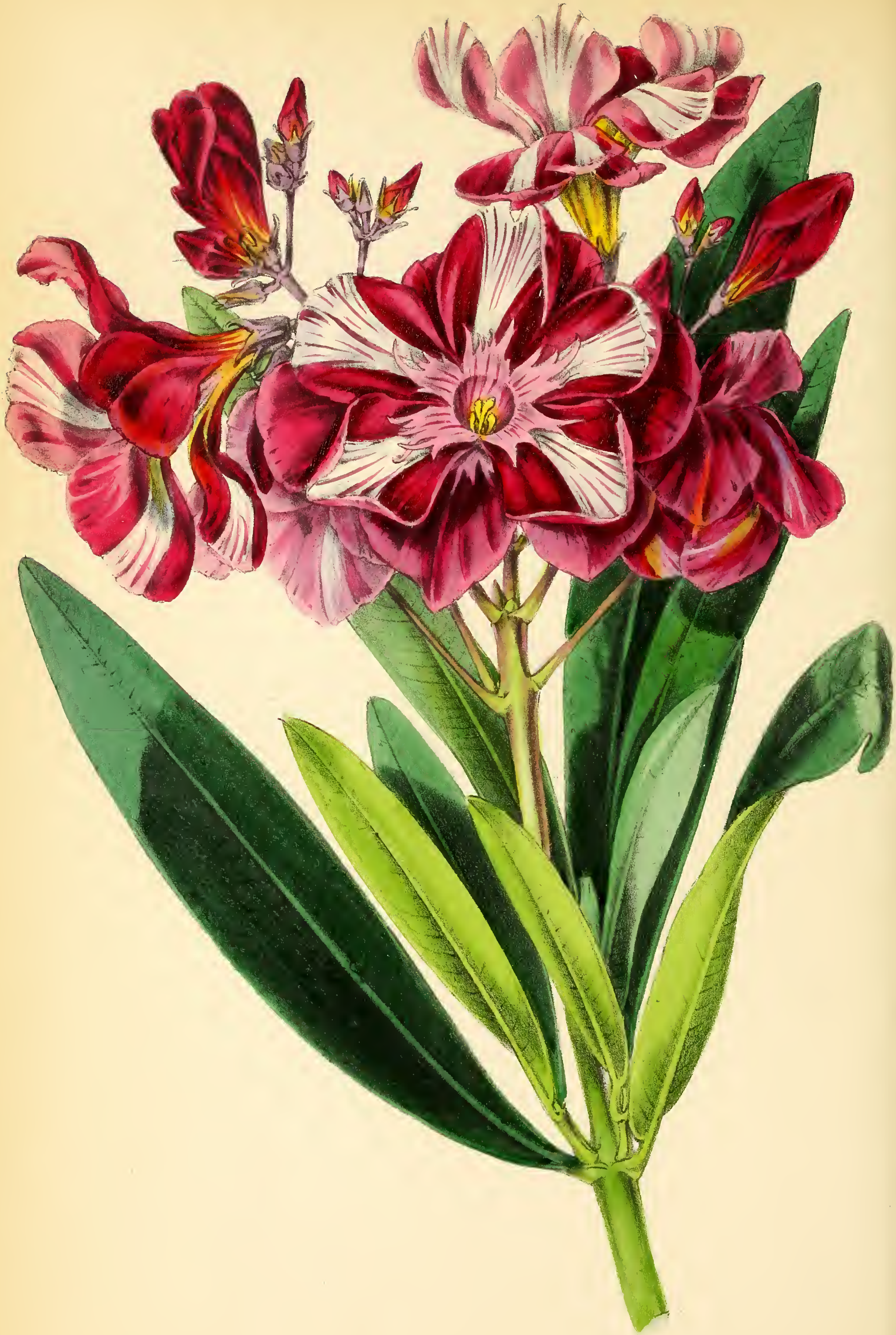
It has, however, been long known in the stoves of this country, for we find, in Dr. Smith's Exotic Botany for 1785, a figure of it, which is stated to have been taken from a plant that flowered a short time previously in the stove of the Hon. Charles Greville, at Paddington. Although it will thus be perceived that the plant has been cultivated in England for more than fifty years, it is at present but rarely met with; yet, as it produces its flowers during the three winter months, and as those are highly beautiful, very abundant, and remain expanded a long time, and as the plant is likewise very easily propagated and cultivated, it merits a much more extended circulation than it has yet received, and is undoubtedly a most desirable and valuable stove plant.

It grows freely in a compost of equal parts of heath-mould, decayed leaves, and light loam, provided it be carefully potted, and judiciously watered; for as the roots are small, they cannot endure any immoderate supply of water. It may be readily multiplied by cuttings of the half-ripened wood, planted in the same or a rather more sandy soil, and plunged in a gentle hotbed, under a hand-glass.

In a communication which we received from Mr. Hereman, while gardener to R. Hall, Esq., accompanying the drawing of this plant, he appears to consider it the *Turnera elegans*, of Otto, and also that it is a South American species; but it is obviously identical with the *L. trigynum* figured in the Botanical Magazine, t. 1100, where it is distinctly stated to be an East Indian plant; and as we happened to possess specimens of it in full flower at Chatsworth at the time the drawing was sent, which were introduced from the East Indies by Mr. Gibson, his grace the Duke of Devonshire's collector, the fact of its being a native of the East Indies is placed beyond all doubt; and though some eminent botanists have been led to question whether this plant is really a species of *Linum*, it has never, we believe, been separated from that genus.

The generic name is derived from the Celtic word *Llin*, signifying a thread; most probably in allusion to the well-known useful purposes to which some of the species are applied.

The specific name is peculiar to this plant, on account of its flowers being furnished with three distinct styles.



S. Holden, del & Lith

Nerium Oleander Tangli

NÈRIUM OLEÁNDER; *var.* TÁNGLÉ.

(Striped-flowered Oleander.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
APOCYNÀCEÆ.

Generic Character.—*Calyx* five-cleft. *Corolla* salver-shaped; throat crowned by lacerated multifid segments; segments of the limb twisted, unequal-sided. *Filaments* inserted into the middle of the tube. *Anthers* sagittate, armed, cohering by their middle to the stigma. *Ovaria* two. *Style* one, filiform, dilated at top; stigma obtuse. *Hypogynous scales* wanting; but there are toothlets at the bases of the calyx, outside the corolla. *Follicles* cylindrical.

Specific Character.—*Plant* an evergreen shrub. *Leaves* lanceolate, three in a whorl, veiny beneath. *Corolla* with trifid or tricuspidate segments.—*Don's Gard. and Botany.*

Var. Tanglé.—Flowers of a rich, crimsony sanguine hue, beautifully and various striped with white and pink like a Carnation, semi-double.

While on a visit to the nursery of Messrs. Lane and Son, nurserymen, Great Berkhampstead, Herts, to examine their celebrated garden of Roses, in the spring of last year, we met with this extremely beautiful Oleander, flowering among slightly forced potted Roses, Gloxinias, Fuchsias, &c. Its name, alone, is known to Mr. Lane, and while it seems to bespeak it of continental origin, it affords no clew to the actual place where it was raised; so that we really have nothing to reveal concerning it, but that it is a most ornamental plant.

The very pleasing hues of the flowers, so like those of many Carnations, give it a peculiar attractiveness. But it is likewise meritorious in blooming while not more than nine inches high, and producing particularly large clusters of its noble blossoms.

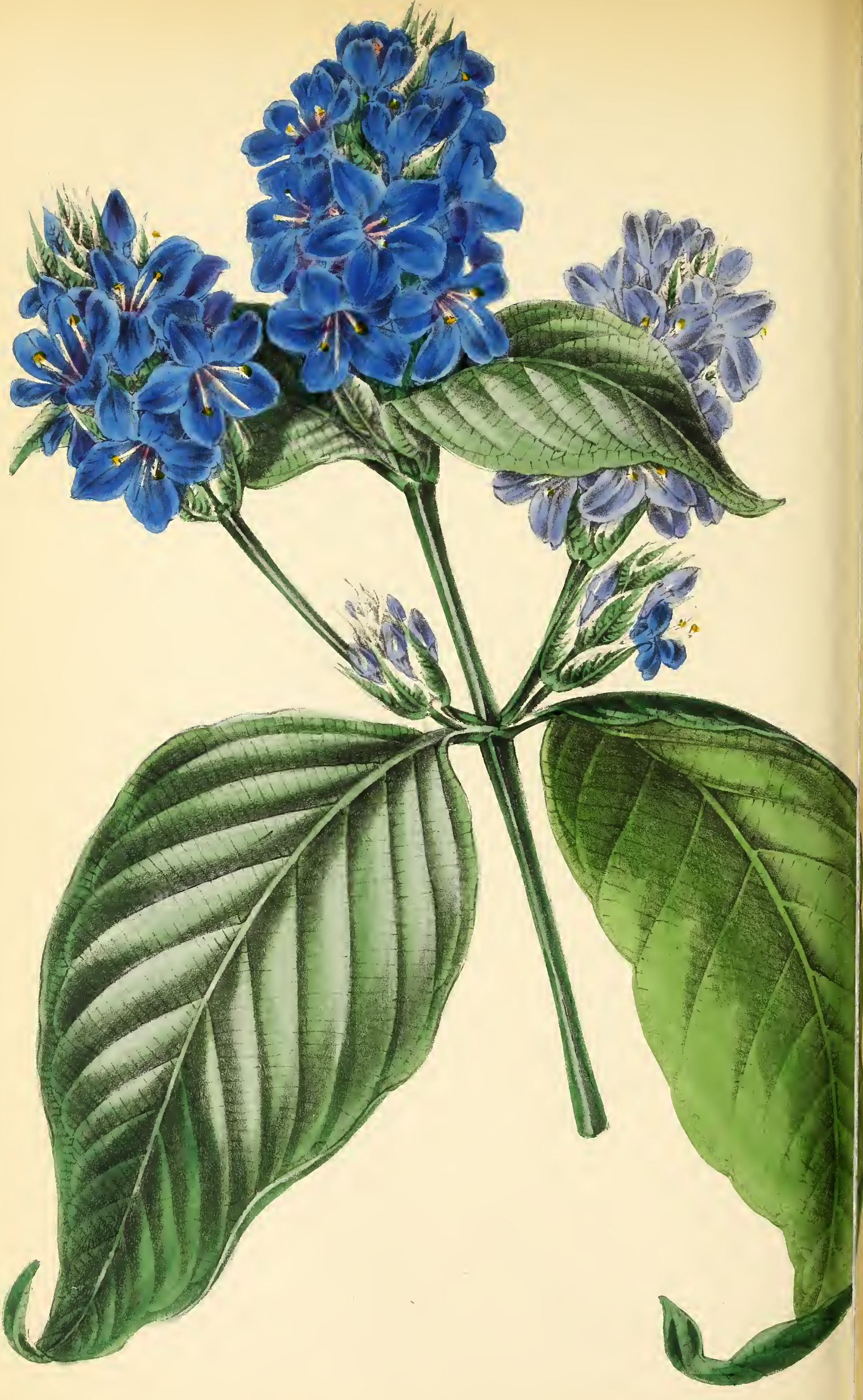
Along with many other fine varieties of Oleander, it deserves cultivating twice as extensively as the majority of greenhouse shrubs. An unfortunate propensity, however, to starve these showy objects and to refrain from pruning them, appears to pervade cultivators; and they are, therefore, mostly seen only in the old-fashioned greenhouses, crammed amongst the tall specimens till nothing but their tops are visible, and thus prevented from exhibiting their truly handsome characteristics.

To grow Oleanders well, they ought to be pruned so as not to get higher than two or three feet, and the soil should be a little richer and less compact than that generally employed, while the pots ought to be somewhat larger, and the pots and earth should be alike unshaded by other plants. A small amount of bottom-heat is of great benefit to them in the late part of the spring, while they are growing; but, when they have finished their developments, they should be kept in a cool, airy greenhouse all the winter, and duly hardened.

As the common Oleander inhabits humid places, both in the East Indies, and the South of Europe, where it is found by the margins of rivers and along the sea-coast, it ought to be very freely watered and syringed in the early summer season. And on this account, too, it should have a rather strong, loamy soil, and not be supplied with heath-mould or sand. Leaf-earth, mixed with the loam, will be serviceable.

It is called Rose-bay, like the Rhododendron; but it is more commonly known by the name of Oleander.

The plant is propagated by cuttings; and, from its extreme beauty, we calculate upon its coming into great favour.



J. Tilden. del & lith

Eranthemum pulchellum

ERÁNTHEMUM PULCHÉLLUM.

(Pretty Eranthemum.)

Class.
DIANDRIA.

Order.
MONOGYNIA.

Natural Order.
ACANTHÀCEÆ.

Generic Character. — *Calyx* five-cleft, tubular, erect, skinny, persistent. *Corolla* monopetalous, funnel-shaped; tube slender, very long; limb five-parted, flat, lobes obovate and equal. *Stamens* two; filaments spiral at the base; anthers nearly ovate, compressed and protruding beyond the orifice. *Style* ovate. *Stigma* erect, unequal. *Ovarium* spatulate, compressed, two-valved. *Ovules* solitary, lentiform.

Specific Character.— *Plant* an evergreen shrub. *Leaves* lanceolate, ovate, strongly nerved. *Flowers* spiked. *Bracts* lanceolate, imbricated.

To secure a gay appearance in the stoves and greenhouses during the winter and spring months, when every thing in the open ground exhibits the most uninviting aspect, has long been a desideratum with cultivators. Much has undoubtedly been done towards effecting this desirable object, by modern skill in forcing and retarding the natural period of blooming, and by the increase of species with a tendency to winter flowering. But with all this, there is yet a want of variety; and this deficiency is more especially felt with regard to blue-coloured flowers. White, and red in all its shades, are more prevalent, and these are produced in tolerable abundance; but other colours are needed to give that idea of perfection in winter, which is so delightfully experienced in the summer season.

To look back and select from those plants which have been in the country some years, and, through the rage after novelty, have been thrown aside and disregarded, has long been a peculiar feature of our Magazine, and it is with pleasure that we now give a plate of the present much neglected plant.

Combined with the disposition for winter flowering, this species has an erect bushy habit, without any tendency to become straggling, or naked in the lower part of the stem. On the contrary, it is clothed with leaves of a full deep green, and of considerable breadth, down to the very edge of the pot, if any attention at all is paid to its culture. The intense brightness of its sky-tinctured blossoms lends a showiness during the first three or four months of the year, which is the more acceptable from having fewer competitors than if they were produced at a more advanced period.

To realize its highest character it must be grown in a roomy pot, or planted in a border. When grown in pots, it must be planted in a more retentive soil than is usually employed, and nothing can be better adapted than a strong loam, such as is procured from the decayed sward of a pasture. A liberal supply of water is indispensable to its vigorous growth. But perhaps it is seen to the greatest advantage when planted in the border of a stove, where its roots are unconfined, and it can grow without restriction. At Chatsworth, from whence our figure was obtained, it is planted in the borders of the large stove conservatory, where it forms bushes several feet in circumference, and produces a profusion of flowers for several successive months. After flowering, the shoots should be pruned back to within an inch or two of their base.

It is a native of the coast of Coromandel, in the East Indies, from whence it was sent to Kew gardens towards the close of the last century.

It may be increased readily from cuttings, put in sand, in a slight bottom-heat; and if allowed sufficient pot room, these will make handsome bushes in the course of a season.

GARDENING AS A SCIENCE.

VEGETABLE PHYSIOLOGY.—No. III.

Stems of the second class are now termed *Endogenous*, and the tribes of plants comprised in it are called *Endogens.* In its structure, this stem though perfect in itself, appears to be secondary, or less complete in its order than that of the *Exogen;* for, as we read at No. 137, of Lindley's Elements of Botany, " the stem of Endogenous plants offers no absolute distinction of pith, medullary rays, wood, and bark."

In respect to number—if we assume De Candolle's computation of 1,000, as including all the tribes of the vegetable creation,—there are 144 endogens to 636 exogens; and in that number are comprised all the true grasses, and of course wheat, barley, rye, and oats, the sugar-cane, the amaryllis and liliaceous genera, and all the noble palm-trees. An accurate and minute physiologist, who, while he watches the *external* habits and growth of those plants which are at hand, investigates by dissection their internal structure, must observe, first, that the *wood* differs essentially from the wood of the exogenous class; second, that the *leaves* have straight or at least parallel veins; third, that the *seed* has but one proper lobe or cotyledon. We shall now notice these distinctive peculiarities in due order:—

1st. The *wood.* In *Exogens*, after the first year, layer upon layer is formed in succession upon, and exterior of the heart-wood, and interior, with respect to the bark. In *Endogens*, it might be said, that there exists no *wood* proper; for even from the first developments of plants which subsequently become trees, the inner substance is, as it were, a mass of pith or *cellular tissue,* interspersed with scattered bundles of ligneous fibre. There is no central pith within a cylindrical sheath; no system of convergent medullary rays; no interposed, regular series of descending fibres; no alburnum, liber, or bark.

We will now assume, as an example, a plant which any one who has a small forcing-house can readily procure, and observe; it is the common date-palm, raised from the seed (or stone) of the date sold by the grocers. We will now trace its growth from the first, for the seed germinates very freely in a pot of sandy loam and leaf-mould, particularly if the vessel be plunged in bottom-heat of 75 degrees, and compare it with a few of the leading phenomena as they are described in that able article, " Endogens," of the Penny Cyclopædia.

Numbers of ligneous fibres, grouped in cords or masses, are arranged in circular order, and pass down the radicle or first root. A student should raise several seeds immediately, and dissect one as soon as he perceives the first development above soil; he will then discover a root of amazing comparative length, which, ere the first leaf is an inch long, will perhaps have coiled itself twice round the bottom of a deep narrow garden-pot. If this radicle be cut across at its base, or below the collar, those dots or masses figured in the referential wood-cut of the Cyclopædia, will be more or less discernible.

The radicle being sufficiently advanced, the first solitary leaf—which we will consider the single *plumule*, (the *lobe* remaining under the surface)—advances, lengthens, and becomes a rigid, plaited, long leaf, not in figure unlike the leaf of *Tigridia ferraria.*

As the plant proceeds, another leaf is produced, interior of the former, not opposite to it, but so situated, as to be about one-third part of a small circle from it. When a third leaf—still within the second—appears, the circle at the base is completed. By the time that another series of three leaves is formed it will be seen that the first three have long footstalks, the broad base of each being within that of the one last produced; that of the first leaf embracing the second, and advancing far round the whole.

Within the leaf a considerable number of cords pass downwards, "and its base passes all round the plumule, and encloses it, while with every successional leaf the cellular tissue increases in diameter to make room for the descending ligneous cords; but these cords, however, soon cease to maintain anything like a parallel direction, but curve outwards as they pass downward." They either terminate about the collar, or above it, in the hardened tissue which forms the outer integument. Thus in the date-palm, the base of each leaf pressing outwards from the centre, forms, as it were, a sort of *bulb* just above the soil. This rounded protuberance is, in fact, the rudiment of the *stem;* for nothing like a stem as yet rises or advances from the centre; but as every leaf is pressed outward and at its base, by very slow degrees the consolidated bases of the whole produce a pseudo-stem. This gradual process is nicely described in the following extract:—

"In this manner leaf after leaf is developed, the horizontal cellular system enlarging all the time, and every successive leaf as it forms at the growing point, emitting more woody bundles curving downwards and outwards, and consequently intersecting the old arcs at some place or other; the result of this is, that the first formed leaf will have the upper end of the arcs which belong to it longest, and much stretched outwardly, while the youngest will have the arc the straightest; and the appearance produced in the stem will be that of a confused entanglement of woody bundles in the midst of a quantity of cellular tissue."

If we seek for examples, one presents itself in the common *cane* of India, (*Bambuca arundinacea*): its external integument is glossy, and so hard as to turn the edge of the keenest knife; yet this external covering possesses little in common with the bark of trees. Cut a slice transversely, and as thin as possible, and the microscope, by aid of a powerful reflected light, will exhibit the numerous masses of fibres, amidst the now arid remains of cellular tissue. Take a thin slice lengthwise, and the fibrous system will be rendered more continuously visible. A reed from our own ditches will furnish additional evidence, though less perfect at some of its stages of growth.

The annexed figure may serve to convey some idea of the great distinction which exists between stems of the two classes already described. Fig. 1. is part of the upright stem of an exogenous plant: *a*, is the bark covered by its *epidermis* or cuticle; *b b*, point to the concentric circles of fibrous vessels that surround the central medullary sheath, and pass downwards and upwards amidst the radiating convergent processes.

Fig 1.

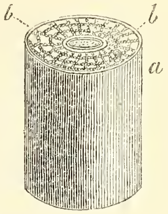


Fig. 2.

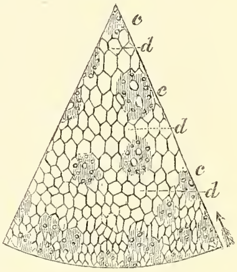


Fig. 2. represents a very thin horizontal slice of the growing sugar cane, a noble plant of the second, or endogenous class. Here *c c c*, show the bundles of ligneous fibres which pass down the stem from its apex to the collar, interspersed among a mass, *d d d*, of cellular tissue, consisting of irregular six-angled cells so piled one above the other at the angles, as to resemble, in a degree, the cells of the honey-comb. We need hardly say, that these cells are the depositaries of the saccharine juices of the cane.

The *wood* of endogens is thus seen to be different in structure and position from that of exogens. It may be questioned, indeed, whether the terms wood and bark can be admissible; although no one will attempt to assert that the chemical constituents of *true wood*, and of the *fibro-ligneous* appendages, in endogens, is not identical. However, as in the higher tribes of this class—the *Cocos*, the Palms, the Pandanus, &c., &c. —stems are ultimately formed; we may admit, with some qualification, the existence of wood, in the abstract; and it now remains to show the manner in which this stem is progressively formed.

As the cellular tissue extends in every direction, the bundles of woody fibres curve outwards as they descend, their lower extremities terminating in a multitude of threads at the circumference, where they become a "*cortical integument*," representing bark, but being, in reality, a closely-packed, hardened series of fibrous threads, of which the interior coating of a cocoa-nut is not an inapt type. This external integument differs more or less in trees of different genera; but, in all, while the external circumference hardens, the interior of the stem remains comparatively soft and open, being composed of a large proportion of cellular substance. On this subject, the authority already cited observes, when speaking of old palms, "that the woody bundles next the circumference are larger and harder than they originally were, and, consequently, we must suppose that they have the power of increasing their own diameter subsequent to their first formations: and that they also act as reservoirs of secretions of a hard and solid nature, after the manner of the heart-wood of exogens.

"When the growth of the stem of an endogen goes on in this regular manner, with no power of extending horizontally beyond a specifically limited diameter, a stem is formed."

Few persons may have opportunity to watch the gradual progress of a stem advancing far in height; yet in a fine collections of palms—as, for instance, that of Messrs. Loddiges, Hackney,—specimens may be seen, which exhibit, perfectly, the external habits of exogenous stems. Thus in the cocoa-nut palm the external coat is rough; it is formed of the bases of decayed leaves, which, falling off, afford traces of their position, and this having been, as before stated, more or less circular, the trunk is marked by a series of scars corresponding therewith.

2. *The leaves* of endogens are also peculiar. They are usually straight-veined; take, for example, the leaves of any of the hardy farinaceous plants, wheat, barley, &c., and of the reeds; or, in the hot-house, those of *Canna* (Indian shot), or its congeners in the Order Marantâceæ. Compare this general and more simple structure (though it be not quite absolute) with that of the multiform varyings and ramifications in the foliage of *exogens*, and a marked difference will be discerned; of causes we know nothing, but these are facts which cannot be impugned. Finally,

3. *The seeds* are equally simple, they have either but one seed-lobe, (*Cotyledon*), or if the rudiment of a second be present, it is imperfect, and not exactly opposite to the true lobe. Of this, more must be said when we come to the investigation of seeds.

The *third* great class—*Acrogens*—comprises those orders of plants which, till lately, were termed *Cryptogamous*. According to Lindley, their *substance* is composed of cellular tissue chiefly, the cells spheroidal or elongated. The *stem* either advances perpendicularly from its point, or irregularly in all directions from one common point. *Seeds*, properly speaking, there are none; consequently, the plants rank under the Order *Acotyledones*, or without seed-lobes. This class comprises the ferns, mosses, lichens, algæ, sea-weeds, and funguses.

The fourth class—*Dictyogens*—we consider as an anomaly not worthy of much interest; and, in fact, when we find only the example *Smilax* in proof that the *stem* has the structure of an endogen, the *root* that of the stems of exogens nearly, and trace it among the *Exogens* order 256 of the Natural System, we perceive no reason to separate *Smilaceæ*—the Sarsaparillas—from the other orders of complete plants.

Our systems of Botany, in their attempts to simplify, afford proof, already but too evident, that a natural arrangement involves perplexities which the thousands of new introductions must inevitably tend to increase.

MANAGEMENT OF PLANTS IN FORCING.

As the production of superior fruit in a forced state, and at an early season of the year, is considered the best evidence of a good fruit-grower; so the production of highly developed flowering plants at an unusually early period, and by the application of a considerable forcing process, ought to be regarded as the strongest proof of an accomplished plant-cultivator.

Not, however, that we would by any means put it forth as a rule that successful forcing is the highest acquirement a cultivator can possess, or is of such transcendant importance that it should engross the chief part of the culturist's attention. It might perhaps be justly argued that the skill expended on bringing a plant to the greatest perfection at its natural period is the most worthily and suitably employed; and that forcing is, properly, only a subordinate department of the art. And we are quite prepared to admit this to a large extent. But still, since the routine of forcing demands, in order to produce very favourable results, a consummate knowledge of the constitution, wants, habits, and aliments of plants, and since these have all to be ministered to in an artificial manner, or nearly so, we contend that a well-forced specimen which is brought into healthy growth, and made to flower in profusion long before it would do so spontaneously, is, if it be one of a collection equally beautiful, and not merely an isolated plant, the child of accident, the best possible demonstration of practical skill in culture.

This being the case, were we to walk through the majority of places at the present time, and examine the forced plants yet in flower, and those which have ceased to bloom and been cast aside; or were we to wait till another January and February and make a similar survey, we fear that, had a considerable number of gardeners no other claim to merit than what they derive from this source, or were their claims to be judged by the state of their forced plants, a very indifferent notion would be formed of their capabilities. In truth, we feel that while the general management of exotics has undergone, and is still receiving, the greatest improvements, such improvements have rarely been extended to forcing.

To adduce a proof of this we may remark that the old practice of having just a few flowers to stud a collection of plants, while all the specimens are crowded together, and are not individually fit for examination, though it has been exploded with respect to general collections, and with reference to plants flowering at the proper time, is commonly continued with forced plants. They are not usually brought to sufficient perfection to be adapted for being looked at alone; and hence, they have to be contemplated solely as part of a group.

Now, there is nothing in the nature of the case to prevent forced plants being rendered fully as symmetrical and showy as those which are not carried out of their ordinary course. The same, or a little extra pains in their preparation, and during their progress, would certainly secure an equal amount of beauty to that which they commonly exhibit at the natural period. We intend, here, therefore, to go into the circumstances which seem to us to be of general occurrence, and which interfere with the attainment of that degree of perfection to which they may readily be raised. It must be clearly stated, however, that we refer altogether or principally to *early* forcing.

What first and most forcibly occurs to us in the consideration of this subject, is the general absence of all that preparation which could adapt the plants for receiving such peculiar treatment. A specimen is taken from the ground in the autumn and potted, or perhaps it is already in a pot, and if it be hardy, or nearly so, it is plunged in some part of the reserve garden till the time arrives for transferring it to the forcing-house, when it is taken up, the pot cleaned, and the soil top-dressed, and at once placed in an hothouse temperature.

On this point, as on many others, we might do well to copy the routine of the fruit-forcer. The same set of Peach-trees and the same set of Vines are forced every year about the same period, and thus they get the habit of being ready to begin growing earlier than others, and their nature is in consequence less violated, and they are therefore more healthy and productive. In introducing an increased temperature to the house, moreover, it is done gradually, according to the manner in which the natural spring opens, and not by a sudden transition from extreme cold to heat.

We do not say that it would be desirable to attempt inducing anything like the habit of being forced in such common plants as Lilacs and bulbs. But for Azaleas, Roses, Hydrangeas, Camellias, and others of an allied order, the plan would be attended with the highest advantage, both economically and ornamentally.

It is on this point, then, that we would fasten special attention. Plants of a woody nature must be prepared for forcing. They must be forced year after year, and brought into the way of readily developing themselves at an earlier season. They must also be treated as single specimens, and with the view of making them separately interesting.

All plants, too, of whatever description, should be introduced gradually to a forcing temperature. They should first be encouraged to commence growing in a moderate heat, and afterwards be placed, when fairly started, in their warmer quarters. Hardy plants, for example, should be put for a few weeks in a cold close frame or pit, or in some part of a greenhouse for a few weeks prior to forcing, and then be removed to a partially warmed Vinery or Pine-pit, or frame, ultimately to be passed to the forcing-pit.

Another portion of the present general system to which we object is the treatment of the plants after they have done flowering. They are at once cast into some corner or by-place, where they will not be seen; and if they be just kept from dying, it is thought they receive sufficient tendance; even though, as in the case of Roses, they may be required for forcing again in the following season. Such a method is more than injudicious. It is fatal to all good results.

If a plant is to be expected to flower abundantly, blossoms will be looked for in vain, unless it be enabled to elaborate and perfect its wood. It must have the means of forming its inflorescence; and these can only be furnished by the assimilation of that kind and amount of nutriment which its constitution demands, and which is to be accomplished alone beneath congenial influences. In fact, the growth of a plant must be healthy and mature before it will flower abundantly; and to render it thus healthy and mature, it must be appropriately treated at all periods of its growth, and not merely while it is flowering. Some plants, indeed, do not grow at all till after they have bloomed, and these consequently require the most attention subsequently to their being taken from the forcing-house.

The fittest treatment which can be bestowed on any exotic that has been forced, is to put it in those conditions where its growth will best be perfected. It should have light, heat, and water, in the same proportions as if it were still in flower, until its wood begins to ripen; when part of the supply of water may be dispensed with. It must be as truly *cultivated* after flowering as before. And this is as indispensable to keep it in a nicely branched and bushy condition, as to render it healthy and productive.

To flower a plant in unnatural circumstances, neglect it, and then suppose that it will necessarily of itself become fertile in the ensuing season, is poor philosophy; and is practised with no single class of plants save forced ones. It is the more extraordinary, too, as the expense of forcing, and the expectations excited, will not be justified unless something tolerably fine be obtained. And it is because we are convinced that here lies one of the chief causes of indifferent success in forcing, that we place so much stress on the injunction to be mindful of the plant's health and wants *after* it has shed its flowers.

Had we to suggest a suitable way of managing plants that have been forced, we should simply say—treat them as greenhouse or stove plants are treated when they have done flowering at the ordinary season. Give them every facility for completing their developments, and strive to make those developments as strong and as regular as possible. Shoots should be stopped, their quantity diminished, the remains of the flowers be taken away, the soil stirred in the pots, or mulched with manure if requisite, or anything else be effected that the best culture may demand to be done, according to the nature of the plants. Above all things, the increasing light of the sun should be admitted to them, and water, whether applied to the roots or sprinkled over them with a syringe, be duly administered.

There are a few other matters relative to the way in which flower-forcing is generally done, which it will be as well now to bring forward; and these concern the rapidity of the process, the condition of the atmosphere, the nearness of the plants to the glass, the propriety of using bottom heat, and the subjects commonly chosen for the operation.

With regard to the rapidity of the process, it may be observed, as it was of its commencement, that the more gradually the plant is made to advance, the more will it accord with nature, and the better will it suit the plant's health. Fast forcing inevitably weakens the specimen, and, besides giving its flowers a feeble character, producing an unfitness for subsequent use. It is consequently to be avoided.

To go into some vineries or other hothouses, and notice the aridity of the atmosphere, it appears surprising how any plants can at all flourish within it. And yet these are often the places where the best exotics are forced. It cannot be too largely insisted that a plant, in its growing stage, is immensely benefited by atmospheric moisture; and this is more emphatically true of forced plants, whose tissue is of course more delicate. They ought, then, to be constantly kept in a house or pit, the atmosphere of which is bordering on absolute humidity, through evaporation from cisterns or gutters, as well as through syringing.

Light, as an essential agent to all growing vegetation, should be peculiarly sought for forced plants; because forcing is conducted at a time when light is so exceedingly scanty, and hence when every ray is valuable. The necessity of keeping all forced specimens in a position where they will catch the utmost possible quantity of solar light, will be strongly apparent, however much it may have been forgotten in practice. They should be elevated on stages to within a few inches of the roof; or, what is better, they should be placed in a pit within the forcing-house, built so as to raise the plants to the desired height.

And this conducts us at once to bottom-heat, which we regard as the mainspring of all forcing operations. It gives out a constant and genial moisture, if the material of it be bark or leaves, and it acts upon the *roots* of plants as well as upon their upper portions. Those who are most experienced in forcing will assuredly give their support to the employment of bottom-heat. That derived from fermenting leaves is the cheapest, and will be among the most appropriate, provided they are duly turned, and the power of the heat moderated, before being used for plunging the plants in.

To say much of the subjects fit for forcing, would call for the production of a lengthened catalogue, to which we are averse. Each cultivator has two or three favourite forcing plants that are not generally used by the rest. We perceive, too, with pleasure, that the list is being much extended. It is doubtful policy, we admit, to abandon confirmedly good sorts for such as have not been tried. But, without discarding such as are known to force well, it will be advisable to try experiments on some which seem to promise success: for, in forcing as much as in other things, variety is desirable, and novelty here would be all the more delightful from the prominence it would gain. We have fancied, especially, that the beautiful class of climbers might be more extensively placed in the ranks of forced plants, from which they are now almost wholly excluded.

If it be thought that this article is untimely, because forcing is at present nearly concluded, we would urge that the parts to which we have given greatest conspicuousness are those which refer to the *preparation* of flowering plants for forcing, and to their treatment after they have been forced. This is the precise period for attending to all such matters.

ON THE USE OF HEATH-SOIL FOR FINE-ROOTED PLANTS.

Probably there is no one subject within the compass of floriculture, on which modern scientific views have thrown so much light, as on the best nature and properties of that soil which is commonly called peat. And as this earth enters argely into most composts, and is extensively used by itself for many tribes of lants, it is very important that correct opinions should be diffused regarding it.

Believing that the notions current among the majority of cultivators respecting his soil and its uses, are highly erroneous, we have deemed it necessary to present few observations on the actual nature of heath-mould, and on those varieties of t which are most suitable for the cultivator's purposes. We shall pointedly ndeavour to render our remarks as popular as possible.

Heath-mould is strictly a mass of vegetable matter in a state of entire or artial decomposition, and is often likewise filled with vegetable roots of a hard ature, which have scarcely begun to decay; and with sand, in greater or less roportions, as well as of various degrees of fineness. It is of very different ualities and textures, according as it is found on dry elevated places, or in shallow eds with a rocky substratum, or in low boggy parts with clay or gravel beds eneath it. That which is got on well-drained spots is generally of a lighter olour, and less compact, because filled with a greater proportion of root fibre. hat obtained from wet and swampy situations is mostly black, of a close texture, odden, and destitute of much vegetable fibre.

There are several varieties of these two principal kinds, and the various sorts so un into each other, that it would frequently be difficult to say to which of these lasses any particular specimen belonged. Yet the distinctions we have named—ith the exception of colour, which is not unvarying — will be sufficient as ractical guides.

Of course it needs no argument to show that the light-coloured, open-textured, ibrous heath-soil is that which alone the gardener ought to employ. The other only fit for burning, or for building rude hovels or banks with.

But there is another characteristic of heath-mould which may serve as a test of s appropriateness for exotic plants; and this is its sandiness. A smaller or larger ortion of sand is met with in almost all heath-soil; and this is either minute and ritty, or approaching to the nature of fragments of sand-stone. Where it ecidedly takes the latter form, it may be regarded as a good ingredient, calculated prove advantageous in rendering the texture more open. But where it is very nall, and exists in any quantity, it is to be considered a bad sign, for such soil is sually devoid of much vegetable fibre, and lies too closely together.

The use of sand, whether as an addition to soil, or as a natural component ereof, will no doubt ere long be generally deemed injudicious, except for cuttings.

It can obviously act only in a mechanical way, and though it has been thought to assist in keeping the soil more open and permeable by fluids, it actually has a contrary effect; for the finer the particles of earth, the more compactly will they set, and small sand has a powerful tendency to consolidate soil unduly into a mass. It is solely as a means of impoverishing soil, therefore, that it will, in a short time, come to be tolerated; and this object can be accomplished so much better, or at least the end for which it is intended can be more satisfactorily attained, by shallow pots, the poorer kinds of heath-mould, and a mixture of larger fragments of sandstone or potsherds.

Regarding the value of sand for striking cuttings in, or for such like delicate operations, there can be little question. It is cleaner; it more easily and thoroughly surrounds the base of the cuttings; it retains moisture more equably, and is not so likely to cause the cutting to rot; it does not so readily obstruct the pores at the severed end, and the young roots can push into it with greater facility as soon as they are formed.

Returning, however, to heath-soil, we should wish to make known those of its properties which give it an adaptation to the particular class which is often distinguished by the term fine-rooted plants. Much of mistake prevails on this matter, and as it must necessarily determine the choice of any peculiar kind of heath-mould, it is the more desirable that it should be well understood.

As a general statement, it might be sufficient to say that its suitability is purely mechanical, that is, it appears to depend entirely on its texture, and not on its chemical ingredients. Yet we must enlarge this assertion a little, and take in some of the details.

Heath-soil is useful to many plants because, when good, it affords an excellent medium for the water to drain through. It does not, if of a proper description, and properly placed, become cold, sour, and sodden in the winter. The water runs through it, to select an exaggerated comparison, as it would through a stack of fine heath-branches or other small wood; and while it leaves every part moist, it does not get saturated. Hence its fitness for delicate-rooted plants, which, if ever they were placed in a saturated medium during cold weather, and at a time when they could not assimilate much moisture, would lose all those numberless little rootlets which are indispensable to their healthy existence.

A further and more important use of heath-mould is in furnishing a clean and congenial medium for the roots of certain plants to penetrate; while it is not, like loam, so readily taken up in solution by water, and presented thus to the tender rootlets. Vegetable mould is likewise always softer than any other, and consequently more easily pierced by slender roots. And it is notorious how delicate fibres seem to love to insinuate themselves among other fibres, such being very rarely found in any soil save heath-mould.

As heath-mould is valuable for maintaining its openness, and therefore for security against saturation, it is also of excellent service, for the same reason, because it never presses too closely upon the tender roots of plants, nor interrupts their extension. It is not liable to become compressed, or hardened, or impermeable to the most slender root.

These particulars, which have suggested and governed the directions previously given, will suffice, first, to guide the cultivator in his choice of heath-soil, and secondly, to give him a hint as to the best way of using it, and the kind of earth which may be most properly substituted for it when a superior sort cannot be procured.

It will aid him, primarily, in judging what properties his heath-soil should possess. It should be very full of fibre, very free from sand, unless, perhaps, a few fragments of sand-stone, and particularly light and open. A close-textured boggy earth is extremely unfit for cultivating plants in. And where there is any depth of it in the bed from which it is taken, it should, when walked over, exhibit a high degree of springiness or elasticity. The same property should, moreover, be apparent when it is made up into an artificial bed, or, if in a pot, when pressed lightly by the hand.

The second point involved in these remarks relates to the fittest method of employing heath-soil. It should be taken in its rough state, and very partially reduced, either for the border or for pots. It should not be divested of any of its fibre, or any small pieces of stone it may contain, and, in the case of external borders, not even the living vegetable matter should be stripped from its surface, for all this will help to lighten it, and to preserve its porosity. In using it for potting, it ought to be broken up by the hand into rough lumps from two to three inches square, put irregularly and loosely into the pot. And especially should care be observed in preventing it from being much trodden upon if in the border, or much compressed in any way when in a pot, subsequently to the period of depositing it in either of such places.

Where good heath-mould cannot be had, the most suitable earth which can be used instead of it is coarse leaf-soil, or that derived from any kind of decomposed wood. This, with fibrous and open loam, or even the latter by itself, will always be infinitely preferable to bad peaty earth. Indeed, what has now been advanced will manifest that any soil sufficiently loose and free in its texture, and which is tolerably neutral in its chemical properties, might be substituted for heath-mould, when this is not obtainable, or cannot be got in a duly fibrous state.

If this article shall at all help to elucidate the true nature and use of heath-mould, and to indicate in what condition it should be employed, we shall feel that a highly desirable end has been gained, and a long stride made in advance.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR MARCH.

ACHIME'NES PEDUNCULA'TA. "This is one of the many fine new plants introduced to our collections through the instrumentality of the Horticultural Society, by their Collector, Mr. Hartweg. It was found in shaded, woody places at Santa Maria, Guatemala, and is now tolerably well known in our stoves, from the liberality with which it has been distributed by the Society." It grows about two feet high, and every part of the plant is more or less hairy. It has large, handsome flowers, nearly two inches long, of a bright red colour, the limb richly spotted with a darker hue. They are "more like those of some Gesnera, than of Achimenes." *Bot. Mag.* 4077.

ARCTOSTO'PHYLOS PU'NGENS. "This seems to be a common Mexican shrub, for it occurs in most collections from that country. In appearance it is extremely like *Arctosaphylos tomentosa;* and an insufficient examination of dried specimens led to the belief, that it is a mere variety of that plant. The fresh specimens show, however, that in addition to a want of the long beard-like hairs of the branches of *A. tomentosa,* this species has the awns of the anthers longer than the anthers themselves, and only seven cells to the ovary instead of ten." Mr. Hartweg met with it in Mexico, at an elevation of 7000 to 9000 feet above the level of the sea, and transmitted specimens to the Horticultural Society. He found it common about Guanaxuato, Real del Monte, Bolanos, and Oaxaco, where it forms a shrub six or seven feet high, with a reddish brown stem and branches, and very hard wood. The natives call it Pinguica, or Manzanilla. "Up to the present time it has proved, in cultivation, to be a neat little half-hardy, or possibly hardy, evergreen shrub, growing two or three feet high. But it is one of those uncertain plants which will die suddenly during the hot weather in July and August, especially after a few hours' rain, if planted in the open border; although it may have been previously in the highest state of health and vigour." *Bot. Reg.* 17.

BE'RBERIS PA'LLIDA. Mr. Hartweg has added seven new species to the number of the pinnated, or ash-leaved section of the Berberis introduced to this country, among which is the present. "In its native country," says Dr. Lindley, "it forms an evergreen shrub from five to six feet high, and is found but sparingly near Cardonal and Zimapan, on mountains thinly covered with *Pinus Llaveana.* Mr. Hartweg also met with it near the hot springs of Atotonilco El Grande, but nowhere in any quantity. That gentleman informs us, that it is easily distinguished by its dry, hard leaves, and pale yellow flowers; and that the wood is also of a lighter colour, than in any other species. In our gardens its appearance is vastly improved, and it will probably prove as hardy as others." "Being at present extremely rare, it has not been tried in the open border; but the appearance of the plant leads us to suppose that it may be, at least, as hardy as *B. fascicularis.* Up to the present time it has been kept in a cold pit in the garden of the Horticultural Society. It may be increased, like the other pinnated kinds, by grafting on the common *B. aquifolium,* either in spring or autumn, when the young shoots are nearly hard; but hitherto the plant has not shown the least disposition to make any lateral shoots, although three feet high. It will no doubt be increased hereafter by seeds, which are likely to be produced freely when the plants get older: as yet, the berries have had no seeds in them. It flowers during the months of January and February, if kept in the greenhouse, and in July it ripens its long erect spikes of deep purple berries." *Bot. Reg.* 16.

BOLBOPHY'LLUM MACRA'NTHUM. "This singular plant was imported by Messrs. Loddiges from Sincapore, and is closely allied to both *B. leopárdinum* and *áffine.* From each it differs in its much more fleshy and larger flowers, whose stalk is considerably longer than the petiole. The flowers appear in March, and expand so flat, that they seem as if they had been pressed between paper. In the centre they are a pale lemon colour, but towards the tips they are much mottled with dark chocolate-coloured spots. Like the rest of the genus, it succeeds best when tied to a block of wood, and suspended to a rafter in a moist stove. If the wood is charred enough to burn off the bark, the block will be found to answer the purpose much better; and all insects that harbour about it will be destroyed." *Bot. Reg.* 13.

NEW OR INTERESTING PLANTS FLOWERING IN THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

Aca'cia. A species allied to *A. brevifolia* and *vestita.* From the first, it differs in having less of the white silvery appearance of the leaves, which, however, are slightly glaucous; and from the second, in their firmer and more rigid texture, and in being destitute of the downy hairs. The leaves have the same oblique form, and are about the size of those of the former species. The heads of flowers are arranged on a loose raceme, on stalks issuing from the axils of the leaves, and assume a drooping position. It is an Australian species, and was exhibited at the rooms of the Horticultural Society, in Regent Street, last month.

Æschyna'nthus macula'tus. Two or three specimens of this magnificent plant are flowering in the splendid collection of Mrs. Lawrence, at Ealing Park. The rich scarlet blossoms, with their deep markings at the opening, and the delicate purple anthers protruding beyond the petals, are produced in large many-flowered clusters; and though they are inferior in size to the gorgeous blossoms of *Æ. grandiflorus*, they are yet equal to that species in beauty. The clusters are borne in profusion near the extremity of the shoots. The leaves are thick and fleshy, shaped like a lance, with long drawn out points, and are of a deep healthy green colour, which contributes much to increase the brilliant appearance of the flowers. As it does not grow so luxuriant and rambling, and is disposed to flower more profusely than *Æ. grandiflorus*, it will be more easily cultivated, and may be grown by those whose space will not allow them to have the other species in perfection. Mrs. Lawrence's plants are grown in pots, which are almost entirely concealed by the pendent branches hanging over the sides. When grown in a basket, with the branches trained loosely around them, it is even more interesting. It may also be attached to a block of wood, with its roots and a portion of the shoots enveloped in hypnum moss; but in this way it seldom grows so freely or maintains a healthy condition so long as when planted in a pot or a basket. It delights in a soil of which leaf-mould forms the principal part. Being an East Indian plant, a warm damp atmosphere, such as is preserved in an Orchidaceous-house, is the most favourable to its growth.

Cypripe'dium barba'tum. Resembling the old *C. venustum* very much, both in the markings of the beautifully mottled leaves, and in the general character of the flower. The petals are clearer in colour, and have more white in the upper part. It was introduced in 1840 from Mount Ophir, and is flowering in the collection of Mr. Rucker.

Cœlo'gyne crista'ta. One of the most showy of the genus. The flowers are large, with a good breadth of petal, and are of a delicate and pure white, with the exception of two lines of sulphur-coloured hairs, which form an elevated fringe along the middle of the lip. The delicious odour that they exhale is an additional recommendation. It is a small plant, and the pendent flower-spikes point out a block of wood as the most eligible mode of cultivating it to show the flowers to advantage. It is flowering in the nursery of Messrs. Rollisson, of Tooting.

Cyrtopo'dium Anderso'nii. Several gigantic specimens of this old West Indian species are flowering in the houses at Ealing Park. The great height of the flower-stem, and the abundance of large yellow blossoms, tinged with brown, give it a commanding appearance. Some of the stems have seven or eight lateral spikes, each carrying about twenty flowers. The leaves are not produced till after the flowers have decayed. A moist atmosphere, tolerably warm, is requisite in the growing season, and the opposite treatment during the season of torpidity.

Dendro'bium æ'mulum. A small species, barely interesting enough to notice, with terminal racemes of flowers in the way of *D. speciosum*, though much larger in proportion to the size of the plant. It has a short stem, three or four inches high, crowned with two or three broad, egg-shaped leaves, terminating in an acute point. The racemes have an easy nodding position, and when the plant is well grown they sometimes become so long as to droop, or curve gracefully downwards from the mere weight of blossoms. In the extreme length of the pointed petals, and, indeed, in the general shape of the flower, it has much resemblance to *D. linguæforme*, noticed last month. The colour of the flower is a yellowish white, and the lateral divisions of the lip are streaked with purple lines. In comparison with many of the showy members of this extensive genus, the present falls into insignificance; yet, as it is one of those which are better grown in a close greenhouse than in the warmer temperature required for the majority of Orchidaceæ, it will be useful to those who have not the convenience of a stove. Attached to a rough piece of bark or the husk of a cocoa-nut, it forms a desirable plant for suspending in a drawing-room, for which purpose the agreeable scent of the blossoms and the long period that they continue in perfection are additional recommendations. It is an Australian species, and has been some years in the country.

Epide'ndrum stamfordia'num. Several varieties of this handsome plant are flowering in the suburban collections. One of these, from the Horticultural Society's Gardens, was shown at a late exhibition in Regent Street. It has a very robust habit, and strong, upright, branched racemes of flowers, more closely aggregated than is usual. Messrs. Loddiges, of Hackney, have another, which varies considerably from the latter both in the colours of the flowers and the strength and direction of the racemes, which are more slender, and quite unable to preserve an upright position. The pleasing diversified assemblage of colour gives to the flowers a peculiar speckled appearance, and this is greatly enhanced in effect by the broad, deep-green foliage. The delicate little spot of purple on the tip of the column is much brighter in these than in the last. We have also another variety, with very long racemes, and the flowers more loosely arranged. The two last are very superior to the first in colour. They are natives of Mexico, and were sent over by Mr. Hartweg, to the Horticultural Society, from Guatemala.

Epipho'ra pube'scens. Messrs. Loddiges, of Hackney, have a plant of this lively-coloured species, with several upright flower-stems conspicuously elevated above the foliage. Though the flowers are not large, they command attention from their deep bright yellow colour, and the unusual manner in which the upper half (longitudinally) of the sepals is streaked with four crimson parallel lines. The middle division of the lip has also two or three crimson lines upon it, and a number of short whitish hairs. It is a fragrant species, and was obtained by Messrs. Loddiges from Delagoa Bay, in Africa. It does not require a warm house, and seems to succeed well in a pot among turfy peat.

Milto'nia. An entirely new species is blooming in the nursery of Messrs. Rollisson, of Tooting. It is of a more vigorous character than the generality of the genus, and appears to be a profuse and free-flowering plant. The specimen we saw had a reclining spike, a foot and a half long. The flowers are large and showy, but not so handsome as some of the other species. The lip is nearly white, and the lower part of the sepals and petals brownish purple, the terminal half being pale lemon-coloured. It has long linear-lanceolate leaves, which are rolled back about the middle, so as to give them a contracted appearance. They spring from the top of the pseudo-bulbs, which are bottle-shaped, and a little flattened.

Onci'dium papi'lio, *var.* There are several varieties of this singular flowering species in cultivation ; but by far the most splendid we have seen is one now in bloom at Messrs. Rollisson's. It has much deeper tints of a more decided character, than any of the others, which it also far surpasses in magnitude. When seen beside some of the older varieties, the superiority is so striking that they would scarcely be thought the same species.

Ornithoce'phalus cilia'tus. To those who feel curious to examine the more minute members of the vegetable kingdom, this plant will prove interesting. It has nothing showy about it, nor is it, in any way, likely to attract notice, save by the singularity of its form. The leaves are sword-shaped and fleshy, varying from an inch to an inch and a half in length, and united at the base, from whence they radiate in the form of a fan. The roots are so small and few in number, that considerable care will be necessary in fixing it to the block, or whatever else it may be desirable to attach it to. They should be enveloped in a little moss, and secured by means of a fine wire. The flowers are borne on short racemes, not more than as long again as the leaves, and alternate on each side of the stalk, which is clothed with minute hairs or bristles. The sepals are smaller than the petals, and both are of a bright, glittering, pellucid white, with three very distinct green lines running nearly through to the fringed edges. Both the edges and the back of the sepals are densely studded with small bristles, similar to those on the stalk. Nearly half the surface of the lip is occupied by a large, fleshy protuberance, which is divided into three upright elevated parts, having their inner surface covered with a tuft of thickly arranged hairs. Thus, every part of the plant strengthens the propriety of the specific appellation ; and we find equal grounds for the generic name in the end of the column, which is elongated into a curved horn nearly as long as the petals, and projects over the callose portion of the lip, bearing an evident resemblance to the beak of a bird. There is a great similarity between this plant and *Trizeuxis trichorhyza*, especially in the arrangement of the leaves. They are both from Guiana, and were imported about six or seven years ago.

Schombu′rghia undula′ta. Distinct from *S. crispa* (which it very much resembles in general features) in the greater size and deeper colour of the flowers. The character of the pseudo-bulbs and leaves is very similar to those of *Lælia superbiens*. The flower-stalk springs from between the two leaves which surmount the pseudo-bulbs, and in Mr. Lawrence's specimen is about four feet long, with nine or ten flowers collected into a head at the top. The lip has a pretty purple colour, approaching violet, and is smaller in proportion to the rest of the flower than in *S. crispa*, which is also more pointed. The side divisions are smaller, and more reflexed. The sepals and petals are the most prominent features of the flowers, being considerably larger than the lip. They re also waved at the margin, and of the same lively purple colour. Another specimen has lowered in the collection of Mr. Rucker, who received it from La Guayra. Like the *Lælias*, it requires a cool house, and must also be subjected to a rather long period of rest, to induce it to produce its flowers.

OPERATIONS FOR APRIL.

Presuming that all the directions given last month have been observed, as far as the means nd requirements of each have rendered them desirable, it will now be necessary to complete hese operations, and prepare for putting the plants in their final quarters for the season. Many f the remarks made last month are equally applicable to this, and especially those relating to he propagation and preparation of plants for transplanting.

The want of a sufficient quantity of pits and frames often induces cultivators to defer endeaouring to promote the growth of the plants intended for bedding out to as late a period as ossible ; and, indeed, they are frequently kept starved and stunted in small pots till they are lanted in the borders, in order that they may not occupy too much space from their increasing ize. A more injudicious practice cannot well be imagined, and its injurious effects on the after ppearance of the flower-garden can never after be wholly remedied. But a great number of pits nd frames, though extremely useful, are, however, not so indispensable as is generally supposed, here a little ingenuity is exercised, a little judgment practised, and a little additional labour is ot grudged.

Substitutes of many kinds may be resorted to for supplying the place of frames when a deficiency f room is experienced, during this and the succeeding month. The only things to guard against ill be occasional frosts, severe winds, and heavy rain. A turf pit, or even a bank of soil raised ound the plants as a partial protection, will be sufficient for many species, if a piece of canvass r a mat be thrown over in bad weather. It will require a little judgment in making the selection o be placed under these temporary protections. Petunias, Calceolarias, and Fuchsias, as well as any others, including most of the annuals raised in pots, may be safely transferred from the its ; and, towards the latter part of the month, Pelargoniums and Verbenas, and the greater part f the more tender species, will be rather benefited than injured by the removal. Such a proceeding ill more than amply repay the additional trouble and attention that its adoption will entail, in he superior health that it will promote, and the consequent earlier expansion of bloom.

Another advantage which this practice will confer, besides admitting a greater number of lants to be grown and kept steadily increasing in size, is the tendency it has to promote their ardiness, and enduing them with the power of resisting the severities and fluctuations of the eather. When plants are confined in frames, or kept in close structures where a high temperaure is preserved, although they may make larger and finer plants in a shorter space of time, et there is nothing gained unless they are very gradually inured to bear a colder atmosphere. rown under such circumstances, they are extremely susceptible of injury, even from a slight epression of temperature. It is better to allow them to form their growth slowly in a cooler tmosphere, which will now be continually increasing, than to reverse the order by growing them uickly, and then subjecting them to a lower degree of heat. The first method will form flowering plants at an early period, whilst the latter will retard them, from the sudden check communicated by the change.

Before the close of the month it will be proper to commence planting out in the warmer and more sheltered parts. No time should be lost, then, in making all the needful preparations and arrangements for the purpose. Provide stakes and labels, and have the ground in proper condition to receive the plants as soon as a favourable opportunity occurs, in order that nothing may interfere with the expeditious and complete effectuation of the work. All that require support should have stakes put to them immediately after they are planted ; and trailing plants that are liable to be blown about and injured with the winds, should be neatly secured to the ground with small hooked pegs; and, moreover, if there is any likelihood of severe weather following, means should be in readiness at some convenient place to protect them.

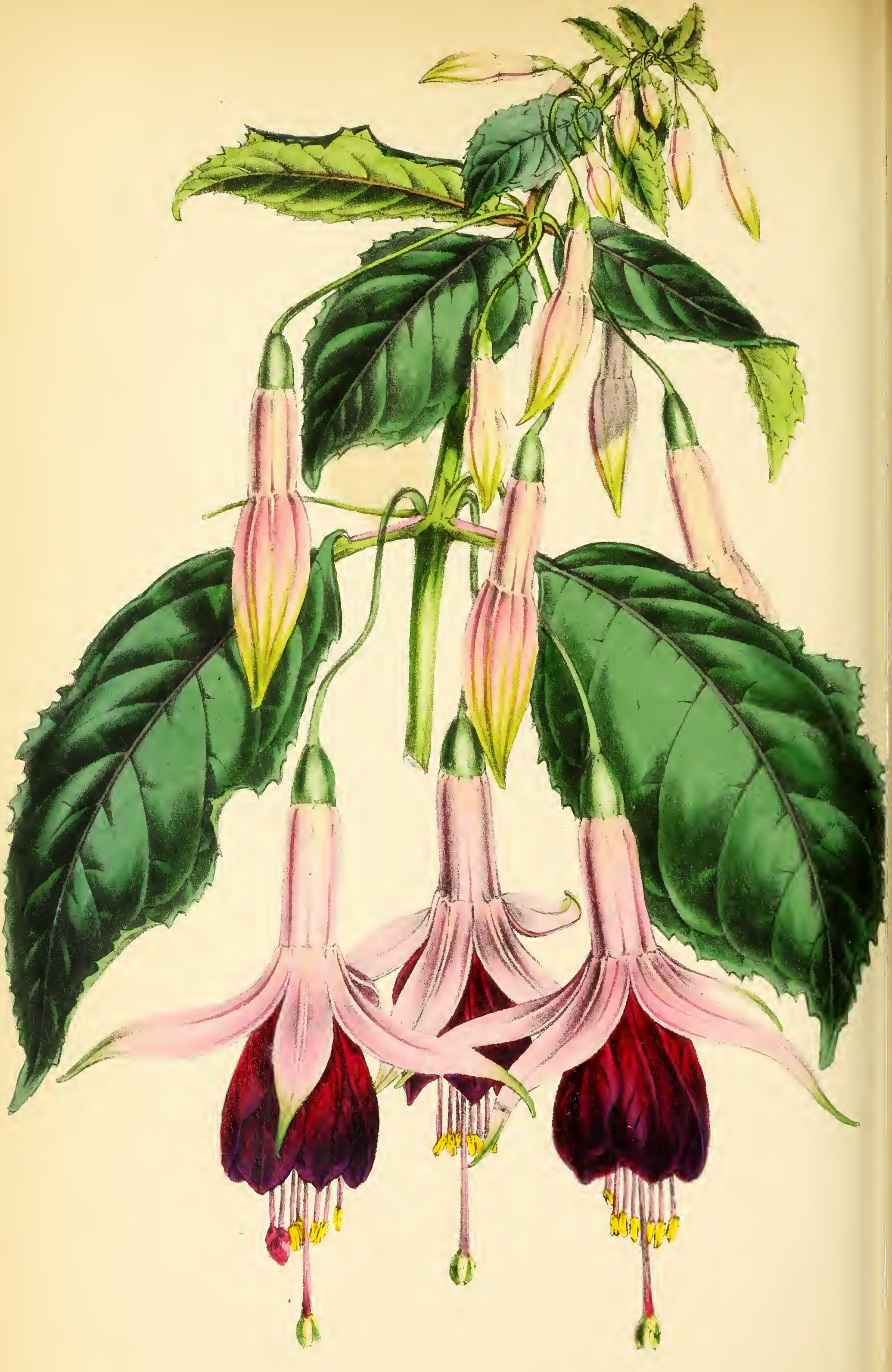
In addition to these needful preparatory attentions, there is yet another of equal importance, that if not already considered should be deferred no longer. This is the arrangement of the plants in regard to the relative position they must each occupy ; and in forming this arrangement attention must be directed to obtaining a situation adapted to the nature and habits of each, and to the distribution of colour, with a view to produce the most agreeable effects. The first of these is the most important, and we cannot neglect it without frustrating our designs, however well they may have been conceived in other respects. Plants that need shelter must therefore be planted in situations that afford it, and to those that prefer a dry soil or an exposed place those conditions must be furnished. Other plants delight in an abundance of moisture, or beneath the protecting shade of trees, and if deprived of such conditions will never grow freely. To all these points, then, the greatest practicable exertions should be extended. It may probably be impossible to accomplish them to the very letter in every case, but circumstances may be modified in some degree to meet all exigencies.

The distribution of colour must be effected so that those which afford the greatest contrast may be brought together. By opposing blue to yellow or red, and the intermediate shades to their corresponding tints, as orange with violet, and orange-red with violet-blue, each colour will appear brighter and more distinct than if the gradation was less perceptible. White may be used promiscuously with any other, for it will always contribute to heighten the effect. The brightness of any colour is further increased when in large masses, and for this reason the practice of devoting whole beds to a single colour is preferable to the old and now almost obsolete method of planting one bed with a variety of colours.

In all plant structures, and especially in the Orchidaceous house, an increase will be required in the amount of humidity, commensurate with the degree of heat maintained. In houses devoted to Orchidaceous plants, water may be sprinkled on the floor several times a day. It is of the utmost moment to keep a vigilant look-out for injurious insects, and wherever they make their appearance, however small the number, let prompt measures be adopted to suppress them. It is only by early effort that they can be kept under.

Greenhouses must have air given to them early in the morning, when the weather is favourable, and in mild weather a little may be allowed to remain on all night. Above all things observe not to crowd too many specimens into the houses whilst they are making their growth. A free circulation of air and a full exposure to light is of the utmost consequence.

Propagation and potting may still be continued where desirable. Annuals may yet be brought forward in pots or boxes to take the place of the earliest sowings, and to decorate conspicuous places. Divide the roots of Chrysanthemums and repot them singly, and plunge the pots to the rim in a frame or in some sheltered situation. Pluck away all decaying leaves and flowers, and maintain a scrupulous neatness in all departments.



S. Holden, del. & Lith.

Fuchsia, Queen Victoria. (Smith's)

SEEDLING FUCHSIA.

(Smith's Queen Victoria.)

A GARDEN HYBRID.

WHAT we lately said about the desirableness of using caution in giving names to Fuchsias, or other hybrid plants that are not sufficiently showy and peculiar, need not now be repeated; and we refer to it only for the purpose of stating that the plant here depicted is most emphatically worthy of being thus distinguished.

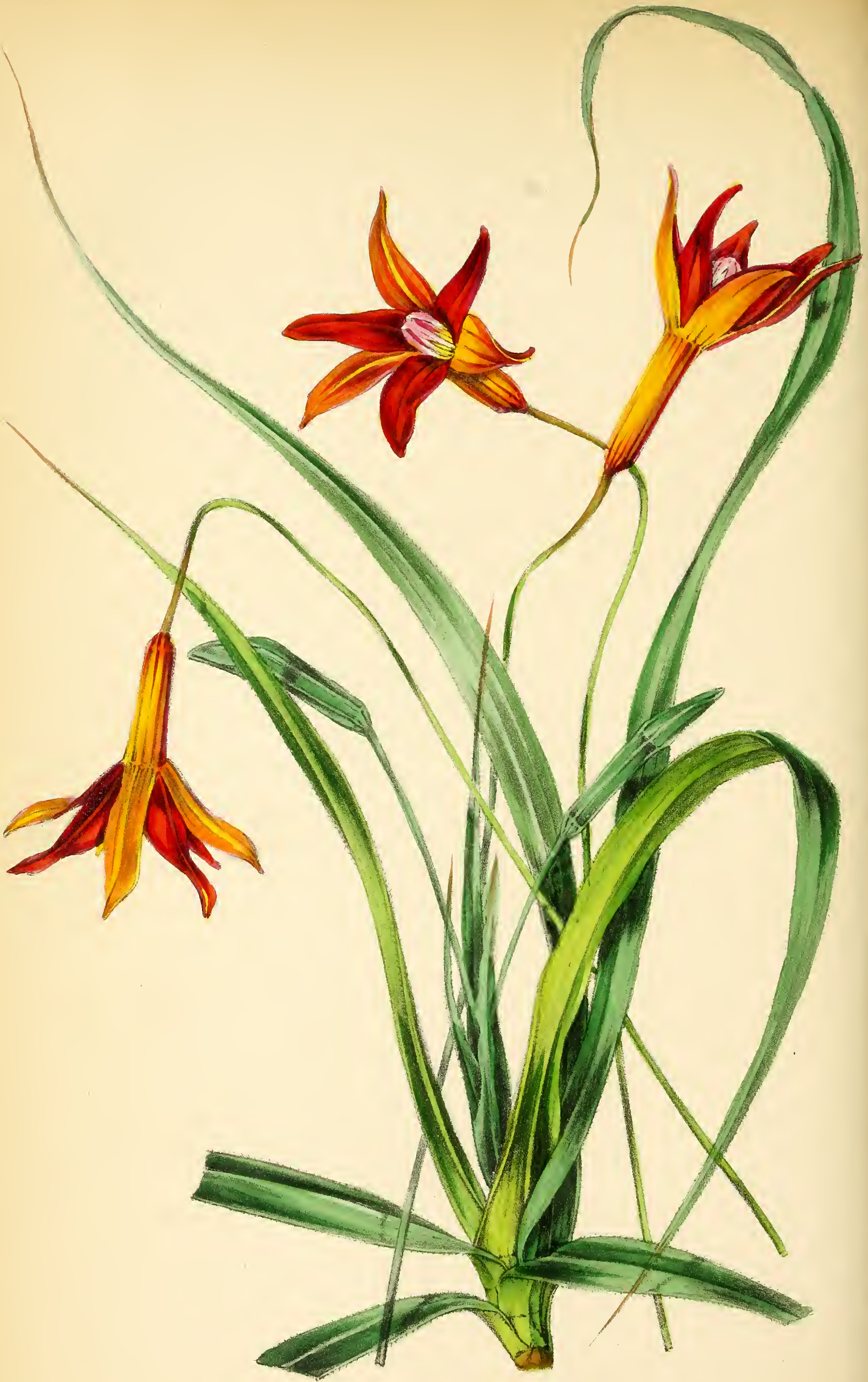
It was raised from seed by Mr. Smith, nurseryman, of Dalston, Middlesex, and elicited considerable attention when it was exhibited at the gardens of the Royal Botanic Society, in Regent's Park, last July. Indeed, it may be deemed the best and most conspicuous hybrid that appeared last season in any of the metropolitan collections.

In a general way, it is after the character of *F. Chandlerii;* but it is a very much superior plant. The habit is stronger and freer, and the foliage larger, while the flowers are far more attractive, and of greater size. Their dimensions, in fact, are nearly twice as great as those of *F. Chandlerii*, and the colours are richer and more decided. The sepals are of a pale whitish blush, tinged with green at the tips, long, pointed, and seldom at all reflexed, though expanding well. The corolla is particularly large, and of a deep purplish crimson hue. The plant bears its flowers in great abundance from the axils of its leaves.

Mr. Smith having now, we believe, obtained a small stock of it, will most likely be able to supply it towards the end of this season.

Its capabilities as an ornamental plant have been by no means yet developed; and it will doubtless form an admirable plant for purposes of show, when grown as a specimen. It will most probably be one of those sorts which look best when kept in a comparatively small state; and hence it will be advisable to propagate it frequently from cuttings in order to have young specimens. After it begins to grow in the spring, it should never receive a check till it has nearly ceased to flower in the autumn.

One of its good properties appears to be that its blossoms do not fall off, like those of other Fuchsias, but remain on till they are quite withered. It also bears forcing remarkably well, and has been in flower with Mr. Smith for several months.



S. Holden del^t & Lith

Barbacenia squamata.

BARBACÈNIA SQUAMÀTA.

(Scaly Barbacenia.)

Class.
HEXANDRIA.

Order.
MONOGYNIA.

Natural Order.
BROMELIÀCEÆ.

GENERIC CHARACTER.—*Perianth* a corolla, adhering o the face of the ovarium, funnel-shaped, six-cleft. *Filaments* bifid. *Anthers* fixed by the back to the ower part of the divisions of the perianth. *Fruit* a hree-celled capsule. *Seeds* numerous.

SPECIFIC CHARACTER.—*Plant* an herbaceous perennial. *Stem* short, simple, densely clothed with leaves. *Leaves* linear, acuminate, smooth, slightly glaucous, with numerous minute spinous serratures at the margins. *Scape* a little longer than the leaves. *Flowers* with a cylindrical tube, longer than the ovarium, and a spreading limb. *Filaments* short.

FOR the introduction of this plant, cultivators are indebted to the enterprising eal of Messrs. Veitch and Sons, of Exeter, whose collector, Mr. Lobb, forwarded eeds from Brazil, in 1841, from which a number of plants have been raised, which ave flowered in the valuable collection of those gentlemen during the spring of he present year; and from one that they exhibited in March, at the Horticultural neeting in Regent Street, we have been enabled, through their obliging attention, o prepare the accompanying drawing.

The genus *Barbacenia* has been long known to the admirers of plants through he *B. purpurea*, another Brazilian species of considerable merit; and through the nore recently introduced *B. gracilis*. Besides the present, these are the only pecies which have been received in England.

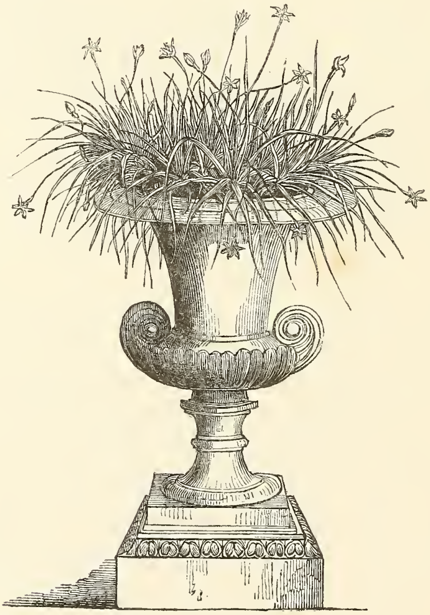
Twelve species are mentioned by Martius in his *Plantarum Braziliensis;* and ngravings and descriptions of six are furnished in the same work, all of which are lifferent from the three above mentioned. They were found growing on arid situaions on mountains, at an elevation of from 1000 to 1500 feet, and only between he 14th and 23d degrees of latitude. One of those species, *B. tricolor*, apparently ears a strong resemblance to the subject of our plate, but is a dwarfer plant, and ssentially distinct in specific character. The leaves are shorter than the scape; nd the flowers, instead of having the inside of the petals of a deeper colour than he outer, are just reversed.

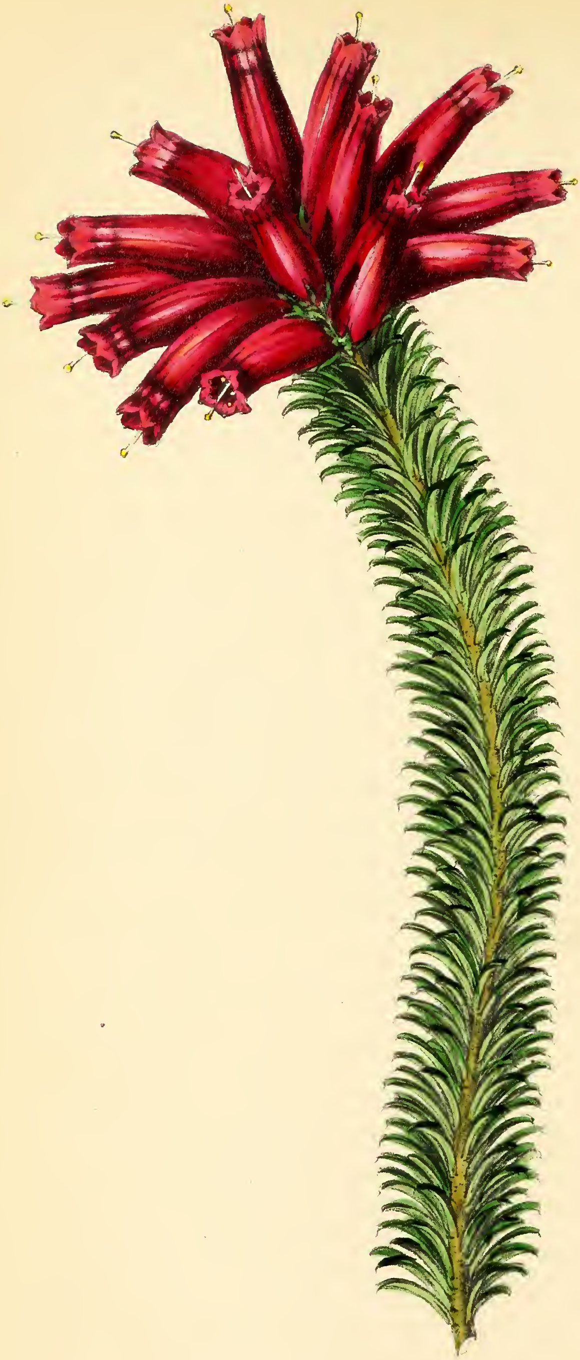
Most of the species—and amongst them the present must be enumerated—have ong narrow leaves collected on a short stem into a tuft, and when without their owers have an appearance resembling some of our mountain sedges.

Few plants are able to bear the want of water for a longer period without sustaining injury. And, except during the period of the most active growth, much moisture appears to be inimical to their welfare. It ought to be sparingly applied at all other seasons, and, even then, it will be necessary to use it cautiously. The soil must be well drained, so that no superfluous moisture may stagnate about the roots. After they have completed their growth, they must be preserved as free from wet as possible. To induce them to develop an abundance of bloom, a dry and cool situation is indispensable during the latter part of summer, and throughout the winter. On the approach of spring they must be removed to a warm and humid stove, or placed in a pit with a steady bottom-heat. In stoves, where there is the conveniency of rockwork, they may be planted along the front, or in some part where they will not be far removed from the eye. But it is as a pot-plant that it appears most likely to succeed best.

Propagation will probably be attended with difficulty unless seed can be matured, and we are not aware that any has yet ripened.

The generic name was given by Vandelli, in honour of Barbacena, a governor of Minas Geraes, in Brazil. The wood-cut below shows the whole plant, in one of the handsome vases manufactured by Mr. Falcke, of Battersea.





S. Holden del & Lith.

Erica Murrayana.

ERÌCA MURRAYÀNA.

(Mr. Murray's Heath.)

Class.
OCTANDRIA.

Order.
MONOGYNIA.

Natural Order.
ERICÀCEÆ.

GENERIC CHARACTER.—*Calyx* four-sepalled, inferior. *orolla* with four divisions. *Stamens* inserted in the eceptacle. *Anthers* bifid. *Capsules* four-celled.

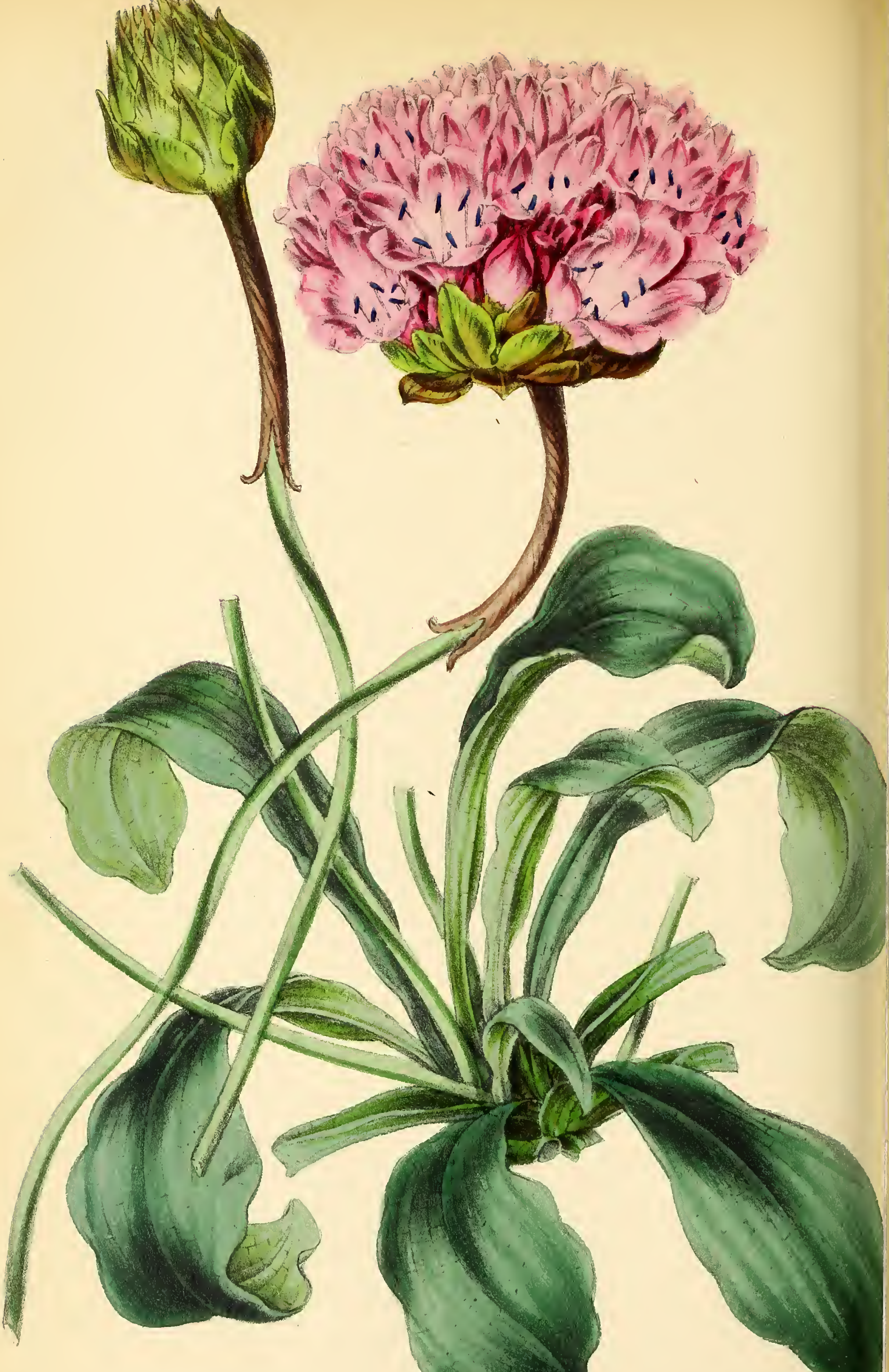
SPECIFIC CHARACTER.—*Plant* with much of the habit of *E. aristata;* and flowers intermediate between that species and *E. vestita coccinea.*

THE practice of hybridising Heaths has now been carried to a considerable xtent by some cultivators, and our pages have contained figures of several xcellent seedlings. But no one will assert that there is not an ample field for urther improvement in this way, since the genus is so very large, and the species o varied.

The plant before us is another worthy result of experiment in the intermixture f properties. It was reared from seeds by Mr. A. Turnbull, of Bothwell Castle Gardens, near Hamilton, Scotland, and has been named by him after his friend Mr. Murray, of the Glasgow Botanic Garden. Mr. Turnbull has very kindly ent us specimens, from which we have had our drawing made, and he favours us with the following history of the variety :—

" *E. aristata minor* being a dwarf compact grower, and *E. vestita coccinea* a ambling grower, my object in crossing them was, if possible, to get a variety with the dwarf habit of the former, and the brilliant flowers of the latter. With his view I impregnated *E. aristata minor* with the pollen of *E. vestita coccinea*, in he spring of 1837. The seeds ripened freely, and were sown in the autumn of he same year. A few of them vegetated the following spring (1838), and the emainder twelve months after. As I could not spare room for keeping them all, o soon as I could form some idea of their habits I destroyed all those that pproximated most nearly to the male parent, reserving only six or eight of those hat appeared most dwarf. Of these I bloomed four in the autumn and winter of 842, three of them being very nearly the same in every respect as the specimen ent, while the other one is very different, being contracted at the mouth of the corolla, in the way of *E. epistoma*. None of the plants exceeded eight inches in height when they bloomed, and I think they are likely to continue dwarf in their habit, while their general appearance will certainly bear a considerable resemblance to the *Vestitas*."

E. Murrayana appears quite to have realised Mr. Turnbull's wishes; for its habit is very like that of *E. aristata*, and the flowers are as rich as those of the male parent. It is a most beautiful hybrid, and other similar ones, which we have received from Mr. Turnbull, are almost equally good. The specimens evinced the highest state of health, and Mr. T. cultivates his plants according to the well-known treatise of Mr. M'Nab.



S. Holden, del. & lith

Statice Pseudo Armeria.

STÁTICE PSEÙDO-ARMÈRIA.

(False Thrift.)

Class.	*Natural Order.*	*Order.*
PENTANDRIA.	PLUMBAGINÀCEÆ.	PENTAGYNIA.

GENERIC CHARACTER.—*Calyx* monosepalous, undivided, persistent. *Corolla* funnel-shaped, five-cleft. *Filaments* awl-shaped, shorter than the petals, and attached to their claws. *Anthers* incumbent. *Styles* spreading. *Stigma* acute. *Capsule* solitary, somewhat cylindrical, one-celled, and one-valved, with five points, clothed with the permanent calyx, and surmounted by its filmy border. *Seeds* solitary.

SPECIFIC CHARACTER.—*Plant* an herbaceous perennial. *Leaves* obovate, tapering downwards into bordered footstalks. *Scape* round, eighteen inches high. *Flowers* collected into dense globular heads, rose-coloured.

EVERY one acquainted with flowers knows the common Thrift, which grows so abundantly on our marshy sea-shores; and the beauty and desirable properties of which have rendered it a favourite so generally esteemed and so extensively grown, that few gardens—from the ample grounds which surround the palace of the wealthy, to the humble plot before the door of the cottager—are unadorned with its simple and lasting flowers.

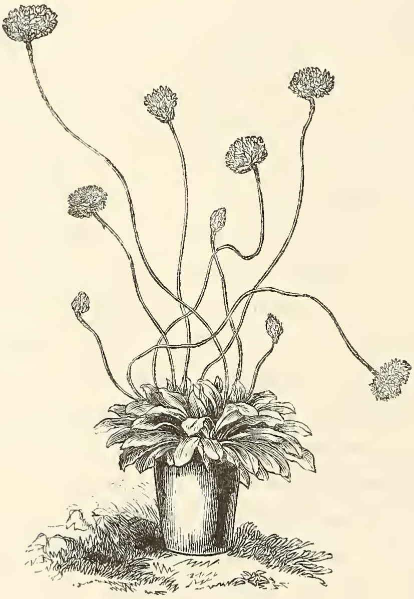
The species we now lay before our readers has many traits of a kindred character. Like it, the flowers are collected and arranged together in a dense and somewhat globular head, supported on a scape which raises and shows them prominently above the foliage. They also possess the same pleasing colour and enduring nature, continuing unchanged in beauty for a long time. But it is only in some of the varieties of *S. armeria* that the colour of the present is equalled, or even approached, for we find many with very pale flowers; and none of them under any circumstances rival it in the magnitude of the flowers. In fact, the plant is altogether of a much larger size, and superior character. The foliage, too, of *S. armeria* is very narrow, and so thickly arranged that it has become eminent as a desirable plant for border edgings. But a different character is exhibited in the plant before us, and we are not aware of any other species of the capitate flowering section of the genus that has leaves of equal breadth.

As an ornamental plant for the greenhouse or drawing-room, it has considerable merit, being easily grown, and always flowering with freedom. And there is little doubt but it will also admit of being gently forced into early bloom; if attempted, however, it will be quite necessary to observe a degree of caution, for too high a temperature produces weak and drawn-out flower-stalks, which are unable to support the cluster of flowers in an upright position ; and it has also a tendency to detract from the merit of the blossoms, in causing them to be fainter in colour.

To the flower-garden it will likewise be an acquisition of some importance, if planted closely in beds. We have not learned that its hardihood in enduring the severity of our winter without protection has yet been sufficiently tested, but it is not unlikely that it may eventually be found to need little or no shelter.

Respecting its native country, we have been unable to gather any information. Messrs. Rollisson, of Tooting, received plants of it from the *Jardin des Plantes*, in Paris, in the summer of 1841 ; but these were unaccompanied with any memoranda. Probably, with several other members of the genus, it is a native of the South of Europe.

Our drawing was made last spring in the nursery of Messrs. Henderson, of Pine-Apple Place. A wood-cut representation is also subjoined.



GARDENING AS A SCIENCE.

VEGETABLE PHYSIOLOGY.—No. IV.

Having investigated the external figure, or, as we may term it, the *skeleton*, of a plant to an extent, at least, which may stimulate the inquiring mind to investigate more profoundly, we are naturally led to its clothing or garniture.

The Leaves—"those great sources of the permanent beauty of vegetation"—will be found, if we admit the theory of the late Sir H. Davy, "though infinitely diversified in their forms, in all cases similar in interior organisation, and performing the same functions." Of these, he adds, "the green membranous substance may be considered as an extension of the parenchyma," *(cellular tissue,)* "and the fine and thin covering as an epidermis" *(Agr. Chem.)*.

Lindley distinctly asserts that "a leaf is an expansion of the bark immediately below the origin of a regular leaf-bud, and is an appendage of the axis." And this opinion receives confirmation so far, that, in separating by natural exfoliation, a scar is left, which does not appear to extend below the bark: but then we find evident proof that there have existed connecting vessels and fibrous tissue; and which, we suspect, have penetrated far deeper into the cellular substance of the wood of trees and shrubs, and into parts corresponding therewith in herbaceous subjects.

Dr. John Aikin appears to sanction the idea that each leaf sends forth absorbing sap-vessels, which connect it with the trunk, and thus become its own individual supporters; he thus expresses himself concerning the development of buds:—"The absorbent vessels of the leaf having exhausted themselves in the formation of the bud, are unable to bring it nearer to maturity; in this state it exactly resembles a seed, *containing within it the rudiment of vegetation*, but destitute of absorbent vessels to nourish and evolve the embryo. Being, however, surrounded by sap, like a seed in moist earth, it is in a proper situation for growing; the influence of the sun sets in motion the juices of the bud and of the seed, and the first operation in both of them is to send down roots a certain depth upon the inner bark of the tree, till they reach the part covered by the earth."

The above theory was announced forty years ago; and in what have our modern physiologists improved upon it? It may not be true—nor, indeed, is it directly asserted—that each leaf sends a root to the ground; but it teaches that *every bud is a system of life*, for a time aided by the leaf which is usually situated immediately below it, (in the lime-tree—*Tilia*—the bud is actually ensheathed by the base of the footstalk,) but being embedded in juicy tissue, it is evolved in due season, and then sends forth radical fibres into the branch, while it propels upwards a new shoot with all its appendages. At this point we would again impress the important fact, that every new member of a plant is a development of something pre-formed; and this fact becomes still more evident by the almost immediate effect of close pruning; take, for example, a shrub which, as a semihardy evergreen, is one of the most graceful in creation—the *Eugenia myrtifòlia.* If this shrub be by accident injured, either by sudden or too much exposure to frost, its brilliant foliage and tender shoots are disfigured. Upon examination, it will then be seen that not a trace of bud can be discerned at the lower part of the stem, at which place it sometimes is needful to head it close down, so much as to leave only four or five inches of stem above the soil. If the plant, uninjured in its roots, be thus treated, and kept moderately watered in a cool greenhouse, fresh and numerous shoots will be protruded from the bark, and that in order beautifully symmetrical; in a word, an entirely new and perfect plant is produced in one season. These buds must have pre-existed, remaining however dormant (yet sustained by the nutrimental matter of the medullary tissue) till they were called into motion by the vital principle.

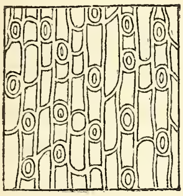
A leaf is a portion of this new system of life; it is developed, and enlarges with its growth, and therefore partakes of the nature of the new succulent shoot; we have therefore to consider the nature of the leaf, and to inquire into its component parts.

Whether it be *sessile*, that is, seated without footstalk close to the shoot, or *petiolated*—attached to its shoot by a stalk—it is connected with the vascular system by fibres and cellular tissue, which supply it with sap. These vessels pass in bundles, and ramify in various directions, constituting veins or nerves, the chief running along the centre, and becoming the midrib. But the substance of the leaves is in a great degree made up of cellular green tissue, deposited intermediately between the veins; we say green in a general sense, because most leaves are green, but to this, as in most other respects, the colour and arrangements of the cellular matter admit of numerous variations. "All," as Lindley remarks, "that appears uniform, with respect to this substance is, that it contains Chlorophyll in abundance, that it is traversed by air cavities in all directions, and that the latter are universally in communication with the *stomates*," (*stoma*, Greek, a mouth,) or oscular pores—orifices which open a passage—pervious to the atmosphere, and by which it is reasonable to suppose the functions of respiration, of inspiring, transpiring, or both, are carried on. By the term *Chlorophyll*, is implied the *yellowish-green* tinting matter of the leaf; it is of modern introduction, and is sufficiently expressive of the meaning intended to be conveyed.

The pores are beautifully figured in Lindley's Elements of Botany under the head *Elementary organs*, p. 7, No. 49, where they are described thus—"*Stomate* are oval spaces lying between the sides of the cells, opening into intercellula cavities in the subjacent tissue, and appearing to be bordered by a limb, (*limbus*, border or edging,) when they are viewed from above." The three annexe drawings are calculated to convey some idea of the general position of the vein and supposed oscular pores; they are not portraits, nor could such be attempted because in every plate which we have seen, if compared with a microscopi investigation, some deviation or irregularity has been traced.

It is necessary to premise, agreeably to a former intimation, that, in plants with one seed-lobe, (monocotyledons, or *Endogens,*) the veins are continued in parallel lines from the base or leafstalk to the point. *Corn*, *grass*, *lilies*, *orchis*, furnish examples, and in these the stomates are easily detected, and in general they appear to be seated between the veins, as seen at No. 1; the subject investigated was a *Lilium.*

1



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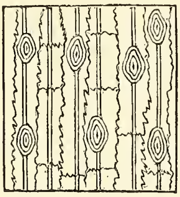

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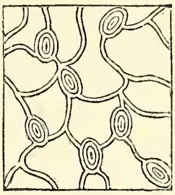


No. 2 is designed to represent the wavy net work of the veins in *Zea mays;* the drawings are usually exaggerated.

No. 3 represents the irregular processes and inosculations of some plant of the great Exogenous class wherein the seeds have two lobes, and the leaves admit of multiform variations.

We may believe that the leaves contain bundles of air and sap-vessels; but here, as in vegetable structure generally, the cellular tissue is presumed to be the chief organ of fluid development and secretion; and as the pores are connected with that system, it is likely that they transpire as well as absorb, and thus keep up a perpetual intercourse with the atmosphere, and this is partially proved by a very simple experiment which some will have an opportunity to observe. Our recital shall be one of facts which actually occurred.

In a house—first built for vines, therefore not capacious in height—a plant of *Musa coccinea* was grown, and flourished luxuriantly. It reached the glass, overtopped a vine, and shaded some of its leaves. When the sun shone powerfully in the forenoon, drops of water were formed upon the vine-leaves shaded by, and in close contact with, *Musa,* the upper surfaces being also completely glazed with water. It was, therefore, the under surface of the Musa leaves that transpired; but there was not the slightest proof that the upper surface of the vine leaves emitted any watery vapour, for not a particle of moisture could be discerned upon the under surfaces of the Musa. Transpiration, therefore, cannot be doubted; and as pores *are* found, particularly on the lower surface of the leaves of trees and shrubs, and commonly upon both surfaces of herbaceous vegetables, it is reasonable to infer that their office is to expel water in the state of vapour, with some carbonic acid.

We do not here refer in any great degree to *functions.* Our object being the consideration of structure, we shall conclude this concise notice by a condensed analysis of the known components of leaves, upon the authority of botanical physiologists, followed by a few observations that have resulted from practical investigation and comparison of facts.

To furnish, then, a condensed idea of the structure of any leaf, we take, as a first position, the following from p. 196 of Lindley's Elements.

"A leaf consists of a *petiole*, or stalk; a *lamina*, or blade; and a pair of stipules"—*i. e.* (a diminutive of *stipes*), props, adjuncts, or more properly, accessary appendages, which, though common, are by no means necessary accompaniments of a perfect leaf. The *petiole* has been already considered.

2. The *lamina* or plate is described as "an *expansion* of the parenchyma of the petiole, and is traversed by veins, which are ramifications or extensions of the bundles of vascular tissue of the stalk; or, when that is absent, of the stem."

We find no defect in this position, other than that it sanctions the idea of an expansion of cellular tissue in the lamina. Now, *a leaf*, however minute it may be in the bud, is equally formed in *all its parts*, the lamina existing coincidentally with its stalk; and it is admitted (*idem*, No. 184) that "leaf-buds originate universally in the horizontal or cellular system." Then all the parts of buds, of which leaves form one of the most important, have been developed perfect in their miniature proportions from the first moment of their existence. If this be correct, the tissue or cellular membrane of the full-grown lamina is an expansion, or growth of parts already existing, not a mere elongation of an exterior member.

But all leaves, according to modern physiology, are not necessarily supplied with laminæ; for it supposes (as in many *Acacias*) that the petiole itself is leafy (?), the true lamina being abortive; and then this pseudo-leaf is called *Phyllodium*.

3. The *veins* are two-fold; one stratum belongs to the upper, the other to the under surface. "The upper conveys the juices from the stem into the lamina, for the purpose of being aërated and elaborated; the under returns them into the bark."

This arrangement is extremely interesting; and it may be investigated by the careful anatomy of a leaf whose cellular tissue has been broken up, as we find it in decayed leaves. This double ramification implies a two-fold office, and seems to point to an analogy with the venous and arterial systems of animal structure. However this may be, and whether or not there exists an anastomosing process between the two systems, the importance of the foliage is thereby enhanced, and rendered still more evident.

FERNS, AND THEIR MANAGEMENT.

To an unrefined mind, no plants would appear to be ornamental but those which bear showy flowers. Conspicuous colours seem essential to the production of what an ordinary taste would account beautiful in vegetation. And thus, the whole race of Ferns, with all their elegance and attractiveness, would be banished as unworthy of cultivation.

Yet it may be assumed that the Fern tribe includes some of the most inteesting of vegetable objects; and their interest is chiefly derivable from the tender erdure of their foliage, and its remarkably elegant forms, as well as graceful isposition. The exquisite green of many Fern-leaves is, indeed, more permanently efreshing and delightful to the eye than the most brilliant tints of the flowers on ome other plants; while their charming figures and airy position are also of a articularly pleasing character.

Ferns are interesting, moreover, on account of their half-epiphytal character, nd from the peculiar manner in which their singular inflorescence is borne. This st is mostly found in small round patches, or long streaks, on the back of the eaves, (or fronds, as they are usually called,) and its colour is commonly brown. he person who knows nothing of botanical structure is often struck with wonder n plucking the leaves of a common Fern about the beginning of spring, when he bserves rows of brown elevated spots on the under-side of the leaves, those near he top of the leaves being always less forward and less fully developed than those t the base. And although no regular arrangement of parts can be traced in these, s in the majority of flowers, they are, nevertheless, most certainly the inflorescence f the plant, involving the spores or germs of future offspring, and producing kind of minute and indescribable seeds, from which young plants may be aised.

Such is the case, however, with the Polypodiums only, and with most of those inds that have their leaves more or less pinnate or divided. Others of them bear heir inflorescence in larger and more irregular patches, as the beautiful *Adiantum apillus Veneris*, common on our old walls. And some, as the *Scolopendriums*, hich have simple leaves, without any divisions, develop their organs of reprouction in long continuous lines, parallel with the edges and middle nerve of the eaves. A few likewise have the backs of their leaves covered with a lively golden r silvery powder.

The value of Ferns, in ornamental gardening, consists, first, in their intrinsic eauty; and, secondly, in their applicability to specific purposes. They are ingularly useful for growing in very shady places, where few other plants ill thrive; for planting on rocks, where they will have but little earth and moisure to support them; for covering unsightly walls, whether in houses or in the pen air; for suspending in rustic baskets from the roof of a stove; for planting mong trees or shrubs in large conservatories or stoves, to give variety and clothing o the ground; for putting amongst the pseudo-bulbs of some Orchidaceæ that are eficient in foliage, or, that present too great a mass of naked pseudo-bulbs; and r enlivening and decorating any rustic work that is made of roots or other old ood. We shall notice separately their adaptation for each of these objects, and fterwards advert to the necessity for giving them a shady situation, a moist tmosphere, and a soil principally composed of vegetable earth, properly drained, n order to cultivate them with any degree of success. It will be well, also, to keep these points in view as we proceed; for, in proportion as any particular system of treatment supplies these desiderata will be the extent of its appropriateness.

Ferns are valuable, we have said, for planting in shaded situations, where few of the ordinary plants will flourish. Indeed, whether it be in the greenhouse or the stove, or in the open air, the majority of the species luxuriate most in a shady place, where the direct beams of the sun cannot touch them, and where they are enabled to exhibit all the delicacy of their structure, and the loveliness of their verdure. Some, it is true, as the beautiful *Adiantum* we have already mentioned, are often found in the most exposed places, and clinging to the face of old walls, where, it would be thought, no plant could exist with so much foliage; but these are the few exceptions. As a rule, shade is what Ferns specially love. Hence, the rockery that has a completely northern aspect, and on which the sun never shines; the entrance to the cool grotto, where light is only partially obtained; the neighbourhood of a rude sylvan grotto, or summer-house; the rough and irregular masses of rock or roots which may be placed by the sides of a woodland walk; and, in houses, the shaded side of the building, the back of any wall, or any position that is o'ercanopied by foliage; present the very best places for Ferns.

Rockeries, also, of all descriptions, are excellently adapted for Ferns, while the latter are singularly fitted for planting upon them. Here is the natural home of many of the British species, since they are commonly most abundant in rocky sylvan districts, and upon various kinds of old buildings.

Ferns are suitable for placing among rocks, because they require less earth than most plants, and because the pores of their leaves appear to be comparatively so scanty, that they can live and maintain a healthy appearance for a long time, with only a small quantity of moisture about the roots.

In open air rockeries, moreover, a considerable number of Ferns contributes much to create a natural aspect; for, mixing with lichens and mosses, these are the usual occupants of rocky places throughout Britain. Stove or greenhouse rockeries, too, are much improved by a luxuriant clothing of Ferns, which, in fact, take away all that coldness and barrenness which are the prominent features of artificial rock, wherever it may be situated. The contrast, likewise, between a mass of sterile and bare rock, and a quantity of waving, plume-like, delicately green foliage, is particularly attractive.

For clothing walls that would be displeasing to the view without some such covering, Ferns are further useful. In many districts of this country, Nature scatters so profusely the germs of this tribe, that they vegetate spontaneously on almost every wall where the bricks, or the stone, or the mortar, have at all begun to moulder from age. And in stoves where Ferns have been grown for any length of time, and where a moderate degree of moisture is kept, we have seen numbers of young Ferns vegetating most freely on a shaded wall, and, ultimately, almost covering parts of it with their soft verdure.

But where such an object is to be artificially accomplished, it must be done by means of some contrivance for giving the wall a rough irregular face, so that it may receive the Ferns to be placed against it, and be capable of holding at least a little earth and moisture for their support. The readiest way of so preparing a wall is to fasten against it rude pieces of wood, such as the protuberances often found on elm-trees, &c. and to cover the face of the wall with these in as varied a manner as possible, leaving holes here and there for the insertion of the Ferns, and finally, nailing bark over the whole, should the wood employed not be already covered with bark.

A wall so faced, and planted thickly with the stronger-growing Ferns, in soil put for them into the interstices or cavities left for that purpose, has a very pretty effect in a stove. Rude pieces of rock may, however, be similarly used for placing against the wall; only they must be fastened to it by mortar or cement. The plants may even be kept in pots, if sufficiently large cavities be left for inserting these; though there is little advantage to be gained from this plan beyond the probability of securing a more regular supply of water, and the facility it gives for removing the specimens, should they be required in another place.

One circumstance in reference to this practice must not here be lost sight of; and this is, that it will not do to adopt it on a wall exposed to the south, unless that wall be shaded by tall trees, or tree-like shrubs, or, in the case of houses, by a canvass or other covering to the roof. A wall with a northern, or north-western, or western aspect, will be in every respect preferable.

It is singular that this mode of concealing ugly walls has not been pursued in the open air, especially in gardens of very limited extent, as those in the vicinity of towns, and still more particularly in reference to those walls which are not much open to the rays of the sun. By a little ingenuity in the disposal of the roots or rocky materials so used, and the intermingling of Ivy and flowering plants with the Ferns planted upon it, the whole might be made very interesting. The wood, or roots, or rock, (or any substitute for the latter,) might even be piled up against the wall, in a tolerably broad mass at the base, and gradually narrowing towards the summit, and made a receptacle for Ferns principally; thus converting a displeasing object into an extremely agreeable one. The main thing to be attended to is to guard against giving the masses so produced the appearance of mere heaps, and to avoid that tameness and wall-like character which it is the prime intention of the entire proceeding to remove. The outlines of all the materials employed, as well as their grouping, should be as bold and rugged as practicable; and the basins left for receiving the plants should be kept out of sight as far as they can be, and by no means be made at all conspicuous.

By putting Ferns in rustic baskets, and hanging them up in the stove or orchidaceous house, another good purpose will be answered. Some of them are very nearly epiphytal, and would thrive well enough in moss if they had plenty of moisture and shade. They might, therefore, even be fixed to a single log of wood, and assisted by a small portion of moss, and they would produce a charming variety among a collection of Orchidaceæ. In the stove, too, they would greatly enliven the general effect, and, by being thus elevated, their inflorescence would more easily be seen and examined.

The better method of suspending them, however, will be to fasten three or four rough pieces of bark-covered wood together in as rustic a manner as is attainable, and to put a few lumps of very fibrous heath-mould in the midst of these, inserting the plants therein. Or a common rustic basket may be formed, or one made of wire employed, and filled with moss and very turfy heath-soil. The *Acrostichums* would look well if managed in this manner, and many others of the more graceful sorts.

When conservatories and stoves, which are of any considerable height, have the plants in them grown in beds or borders, the specimens, as they grow up, generally become bare towards the bottom, and leave the ground beneath them so completely exposed to view, that the eye of taste demands something verdant on which to rest. In short, as in open-air plantations, some kind of undergrowth is needed, to prevent the eye from ranging solely among bare stems.

The cultivator of exotics is not so amply furnished with these as the out-of-door gardener. The Periwinkles and the Ivy of the latter have no related species for the greenhouse and the stove; and to attempt to grow ordinary dwarf-shrubs beneath taller ones is sure to end in failure. If, nevertheless, nothing but a verdant carpet were desired, the *Lycopodiums* would supply this in a perfection excelling even that of Ivy. But something taller and more diversified is requisite, and we know of no plants which would come in so well for this use as Ferns. They would be certain to flourish under the shade of other plants, and they would not rob them of their nourishment. There would also be great variety in their heights and aspects, and the lovely pale green of their leaves would be all the more delighful as seen in conjunction with the leafless stems of the plants above them. In addition to which, they would seem in their natural and proper places.

Of course, we would merely select the most robust, and the least scarce species for the purpose thus referred to. It would not do to put the smaller sorts in such a position, nor would they effect the required end. If there should be any danger of the plants getting injured by moisture, or if the soil in the bed or border should not be exactly appropriate, pots may be used to keep the specimens in; and these can be plunged deeply enough to be imperceptible above the surface of the earth.

Adverting to our next point, which is the embellishment of masses of Orchidaceous plants, every one who knows the tribe is aware that some Orchidaceæ have prominent pseudo-bulbs, with scarcely any leaves; while others bear their foliage after the plant has bloomed, and only during a portion of the year. To atone for this defect, Lycopodiums are introduced among the pseudo-bulbs by some cultivators; and their pleasing appearance is certainly a great improvement. But more leafy plants, or those with larger foliage, seem to be wanted; and we have observed in the noble collection of Messrs. Loddiges that, where Ferns have of themselves sprung up about the Orchidaceæ, and mingled their leaves with the apparently torpid pseudo-bulbs, a far superior group has been occasioned.

To place a few elegant Ferns, then, in the basket or the pot with those Orchidaceous plants that are defective in point of leaves, will tend materially to heighten the appearance of both; and Ferns from tropical countries will be quite at home in an Orchidaceous house, where they will have just the sort of treatment most congenial to them. We need hardly hint that the size of the Ferns should bear some proportion to the usual dimensions of the plant with which they are associated.

Finally, Ferns are exceedingly suitable for adorning any description of rustic work, made with rugged, curious, or half-decayed lumps of wood, or stumps taken from the base of the trunks of trees, including the thicker part of the roots. Such materials are often substituted for rock in giving variety to the sides of little dells or hollows in pleasure-grounds, or in hiding any bank or wall, or diversifying its surface. And Ferns, besides being the class of plants that nature seems to demand for such a situation, would succeed particularly well there, if they had a little shade.

When, however, stoves are intended to hold a miscellaneous collection of Orchidaceæ, Gloxinias, and all those plants that are not of a woody texture, it is an excellent plan to fill up the central compartment with rustic masses of wood, placed tastefully, and plant the specimens among or upon these. And then Ferns may be inserted liberally, with advantage and effect; for what suits Orchidaceæ, Gloxinias, &c., will also suit them, and they will yield a very sufficient share of ornament.

In respect to the culture of Ferns, it is comprised in three or four leading particulars. The first of these is shade. Give a fern a shaded position, and it will assume at once that fascinating light green hue which is the chief characteristic of the race, and which is hardly ever attained in bright sunshine. Shade is consequently indispensable to perfection; and it is essential even to the healthy preservation of many species. It should be obtained either by putting the plants where trees, or buildings, or some other objects, supply it permanently, or by throwing canvass, or some similar substance, over the roof of the house in which the plants may be growing, during sunny weather.

A tolerably moist atmosphere is the next requisite. And this is almost a necessary attendant of shade. Throughout the spring and summer, while the leaves are being developed, Ferns delight in a moderate moisture; and those grown in houses ought to be well watered and duly syringed. The vapour which arises from any body of water, especially in a stove, is likewise beneficial. The beauty of those wild specimens that happen to grow on a shady bank, along the bottom of which a stream flows, is a correct indication of the preference of the plants for a moist atmosphere.

Where shade and moisture exist, there must of necessity be comparative coolness; so that it is not needful to observe that Ferns appear to like a somewhat cool spot. In a stove, it is rather different. Still, they do not want a high temperature there.

Of the soil most proper for Ferns, that caused by decayed vegetable matter is unquestionably the best. Leaf-mould excels all in pot-culture; and where a greater degree of compactness is necessary, the best kind of heath-soil, which is full of vegetable fibre, may be chosen.

Small pots and perfect drainage complete the requirements for Ferns. Their roots are so few that they will not do well in large pots; and they also succeed more thoroughly when the space in which they are planted out is somewhat confined, as the openings in rock or root-work, &c. Where placed in a border, the soil must be very open; and, in all cases, effective drainage is of the utmost moment.

The tribe is so full of interesting plants, which can be readily grown by all classes of cultivators, that we do not feel that too much of our space has been given to it. And the occupants of small gardens, in the suburbs of towns, will find a considerable quantity of the species available for their purposes.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS.

Bromhea'dia palu'stris. Mr. Finlayson found this plant in the Malay Archipelago; and, from the specimens of it in Dr. Wallich's herbarium, almost destroyed by insects, it was referred by Dr. Lindley, with great doubt, to the genus *Grammatophýllum*, under the name of *G. Finlaysonianum*. It has flowered at Penllergare, in South Wales, with J. D. Llewellyn, Esq., who received it from Cuming, with the memorandum that it had been "dug out of a bog in Sumatra." "Having now," writes Dr. Lindley, "had the advantage of examining a perfect specimen in flower, I find that, although nearly allied to *Grammatophýllum*, it is, in fact, distinct. I therefore avail myself of the opportunity of adding to the list of genera the name of Sir Edward Bromhead, Bart., F.R.S., whose investigations of the natural affinities of plants are well known to systematical botanists. In appearance, the plant has the aspect of *Epidendrum elongatum*; and, like it, has the whole of the upper part of the stem provided with closely-pressed distant sheaths, instead of leaves, on which the spike of flowers is arranged. The latter is very rigid, between two and three inches long, regularly zigzag, with a short, hard, tooth-like bract at each bend; so that the spike without the flowers resembles a coarsely-toothed, narrow, double-edged saw. The flowers are about an inch long, white, and rather drooping, spreading quite open. The labellum, in which alone any colour resides, is straw-coloured on the middle lobe, and violet at the tips of the lateral lobes; along the middle, as far as the separation of the lobes, it is convex, and covered with purple down; while the disc of the middle lobe is broken up into yellow granulations." *Bot. Reg.* 18.

Cattle'ya supe'rba. "A very splendid species of *Cattlèya*, and a fragrant one. It was detected in British Guiana, by Mr. Schomburgk, and by him living plants were sent to Messrs. Loddiges, where they blossomed in 1838." Its discoverer remembers that, "in beauty, odour, and duration, it is not to be surpassed by any Orchidaceous plant; the odour in the morning and evening becoming too powerful for a confined place: and its splendid flowers last for two or three weeks." It is a plant with pseudo-bulbous stems, rising about six or eight inches, and terminated by two broadly-oblong, dark-green, leathery leaves, from between which a flower-stem ssues, bearing four or five large handsome flowers, with rose-coloured sepals and petals, and a ip remarkable for its deep purple-red colour, becoming paler at the margin of the side-lobes, and ellowish on the disk. *Bot. Mag.* 4083.

CLERODE'NDRON INFORTUNA'TUM. This plant "was sent from Ceylon to his Grace the Duke of Northumberland, by Mr. Nightingale, and flowered at Syon, in August, 1843." "The true haracters of the species seem to lie in its very large flowers, which are clustered in little heads t the end of the principal branches of inflorescence, and in the large, leafy, coloured calyx, which is *half* split into five segments. It is a truly splendid species, and will be a great addition o a botanical collection, as it is a very free-growing plant." It is a shrubby plant, requiring to e grown in a moist stove. *Bot. Reg.* 19.

DI'SA GRANDIFLO'RA. "Of all described terrestrial Orchidaceæ, this is unquestionably the most beautiful, the 'well-known pride of the Table Mountain,' where Mr. Harvey assures us that very stream is literally bordered with it in the month of March" The stems of the specimens gured in "Lindley's Sertum Orchidaceum" were two feet and a half high, and the flowers ve inches and a half across. Those which flowered in the greenhouse at Kew last August were hort of this size. "The tubers had recently been imported, and they may probably never flower second time; for it is well known that no plants are more difficult to cultivate for a succession f years than terrestrial Orchidaceæ. In the present instance, it would be scarcely possible to mitate the native soil and climate." "They grow," says Sir John Herschel, "where the emperature is occasionally as low as 31°, and also occasionally as high as 96°. The habit is on he margin of pools of standing water, the drainage of the boggy slopes of the mountains, where he roots are immersed. These are dry, or nearly so, in summer. In such localities the plant s, of course, frequently involved in the dense mists of the clouds, which, even in the hottest months, often cover its habitation for a week or a fortnight uninterruptedly." The most showy eature of this truly magnificent flower is the large scarlet sepals, the uppermost of which is elmet-shaped, copiously spotted with dark crimson, and having a yellow margin. The lip and etals are comparatively small. The plant was first introduced to this country about twenty ears ago; but, owing to the difficulty of preserving it, it is far from being common. *Bot. Mag.* 4073.

E'RIA FLORIBU'NDA. "Although the flowers of this plant cannot boast of large size and rich olours, they are by no means destitute of beauty. Arranged as they are in long drooping racemes, lassy in texture, and delicately touched with crimson, they are among the prettiest of the maller kinds. It is a native of Sincapore, whence it has been received by Messrs. Loddiges." *ot. Reg.* 20.

ERI'CA JASMINIFLO'RA. "This very handsome heath was obligingly communicated from the reenhouse of the College Botanic Garden at Dublin, under the name of *E. inflata.* The *E. flata* of Thunberg it certainly is not; but that name has incorrectly been assigned to the *E. sminiflora* of Andrews, to which this plant seems decidedly to belong: and, were it not stated at Roxburgh gives it as an inhabitant of the Cape Colony, I should be disposed to consider it a ybrid between *E. Irbyana* or *E. Shannoniana* and *E Aitoniana.* It has the inflated tube of e two former, and the large limb approaches to that of the latter." The flowers are collected to heads, consisting generally of from 7 to 10 blooms. These are white, tinged with red or ush, and have a very waxy appearance, from the glutinous substance with which they are vered. *Bot. Mag.* 4074.

NEMATA'NTHUS CHLORONE'MA. Specimens of this plant were gathered in the Organ Mountains, by Mr. Gardner, and sent to the Glasgow Botanic Garden, where they flowered in July, 43. Between it and *N. longipes* "the chief distinction lies in the relative length of the duncle and leaves, and of the calyx, segments, and corolla; and the flowers, it may be marked, are smaller, and the spread of the limb less." *Bot. Mag.* 4080.

NELU'MBIUM CA'SPICUM. The drawing was taken from a plant in the nursery of Messrs. ollisson, of Tooting, in August, 1843. "According to M. De Candolle, all the Nelumbia found various parts of Asia are varieties of one species, and this opinion is generally adopted. It however, difficult to believe that the deep-red Nelumbium of India, with very sharp-pointed tals, can be the same with the blunt-petalled white-flowered plant 'found at the mouth of the lga, near Astrachan, &c., amongst reeds, intermixed with Nymphæas and Trapa,' which, according to Messrs. Fischer and Steven, is the locality of this plant. M. De Candolle, indeed, suspected that it must be different, but he did not remark, in the dried specimens examined by him, any character beyond the bluntness of the petals and their general uniformity : and upon that distinction he was unwilling to rely. The true difference seems to consist in the very small number of carpels, which do not appear to exceed nine ; while, in the great Indian species, they are as numerous as 30 or 33." Speaking of *N. speciosum* and its supposed varieties, he remarks as follows :—" I have met with only two sorts on the coast of Coromandel : one with rose-coloured flowers, the other with flowers perfectly white ; and, since that time, a third variety has been brought from China with smaller rosy flowers. They grow in such sweet water lakes, &c., as do not dry up during the driest season ; and, on the coast, flower all the year round. In Bengal they flower during the hottest season—April, May, and June, and ripen their seed about the close of the rains. The white Nelumbium differs in few respects from the red one, and may be considered as only a variety of it." It is a stove aquatic, requiring to be kept dry during winter. *Bot. Reg.* 14.

Pha'ius bi'color. Discovered in Ceylon by Mr. Macrae, but it is unknown at what period it was introduced to this country. The flowers are large and handsome, forming a spike at the upper extremity of the scape, the sepals and petals being of a deep chocolate-brown colour, and the lip yellowish-white and rose-coloured. *Bot. Mag.* 4078.

Phase'olus loba'tus. " The species of *Phaseolus* are very numerous, and at present extremely little known." Mr. Bentham places the present species in the " *Euphaseolus* " group. " It was raised at the Botanic Garden at Glasnevin, from seeds sent from Buenos Ayres by Mr. Tweedie, and flowered in September 1843. Native specimens in my herbarium," writes Sir W. J. Hooker, " also from Mr. Tweedie, prove that it is a native of Rio Negro, in the Banda Oriental. It is not remarkable for beauty, but the structure of the carina (keel) and of the style is very peculiar." It is a twining plant, smooth all over, with ternate leaves and dense racemes of yellow flowers. *Bot. Mag.* 4076.

Phlo'mis cashmeria'na. " To those who possess no greenhouse, this good-looking plant from the vale of Cashmere will be welcome ; for its large pale lilac flowers remain for a considerable time in beauty. It is a hardy perennial plant, growing two feet high, and flowering in July and August." It was raised in the Horticultural Society's Garden, from seeds received from Dr. Royle. *Bot. Reg.* 22.

Quisqua'lis sine'nsis. " This plant was exhibited before the Horticultural Society in July, 1841, by Messrs. Lucombe, Pince, and Co., of Exeter, who stated that it was a more compact-growing plant than the old *Q. indica*, and therefore more desirable for cultivation in pots. It manifestly differs in its smoother leaves and branches, and in the larger size of its flowers, which are, moreover, of a much deeper rose-colour. Upon comparing it with wild specimens of the genus, it appears to be identical with the plant that is found about Canton, and which is probably the *Q. indica* of Loureiro." The plant is a stove climber, of easy cultivation. *Bot. Reg.* 15.

Schombu'rgkia cri'spa. The species of *Schomburgkia* " have been little examined, except in a dried state, for which their fleshiness renders them ill-suited, and hence a difficulty in determining their true limits. The present species has yellowish-brown flowers, with scarcely a trace of purple, and by that circumstance alone it may be distinguished. Its lip is nearly flat, very little, three-lobed, and broadest at the base." It is a native of Demerara. *Bot. Reg.* 23.

Troche'tia grandiflo'ra. " This noble plant was introduced by his Grace the Duke of Northumberland from the Mauritius, and a seedling plant, about six feet high, flowered at Syon, in December last. The blossoms are snow-white, with a yellow blotch at the base of each petal, and are nearly three inches in diameter. Their pendulous position, which occurs in all known species of the genus, gives them a peculiarly graceful appearance." *Bot. Reg.* 21.

Visca'ria ocula'ta. " Professor Lindley and Mr. Backhouse have rightly judged this to be a distinct species of *Lychnis* (or, as the genus is now called, *Viscaria*) from *L. cœli-rosa*. It is a native of the north coast of Africa ; and seeds were received by Mr. J. Backhouse, of the York Nursery, which produced such beautiful flowers that attention was immediately directed to the plant, and it has become a great favourite in our gardens." " It was gathered in Barbary by Poiret ; and, though doubtful whether it should be considered a species or a variety, he gave it the provisional name of *aspera*, which should be retained, although that of *oculata* is, perhaps more appropriate. Not only are the furrows in the calyx of this species wrinkled, as in *V. cœli-rosa*, but the angles themselves are remarkably so, and puckered transversely. The other characters mentioned by Dr. Lindley are equally constant: the sudden contraction of the calyx below the middle, the short notch on the petals, the fine dark eye at the base, instead of the pale and almost white of the old species, and which gives our plant such a lively appearance, the short and broad appendage (corona) to the claws, and the dotted capsule. It blooms in the summer and autumn months, and may be treated as a hardy annual; but the late flowers become paler and smaller in size." *Bot. Mag.* 4075.

NEW OR INTERESTING PLANTS FLOWERING IN THE PRINCIPAL SUBURBAN GARDENS AND NURSERIES.

Aristolo'chia Gi'gas. To one unacquainted with the singular form peculiar to the blossoms of *Aristolòchia*, it will almost be impossible to convey a tolerable idea of the appearance presented by the extraordinary flowers of this scarce plant. They consist of a tubular calyx very much curved, and expanding into an immensely large and broad lip, having no division of its margin, with the exception of an indentation sufficient to give it a decidedly cordate form. The lower part of the lip is extended into an extremely long and linear tail, similar to that of *A. trilobàta*, but far exceeding it in dimensions. Besides the unusual size and singular form, the flowers are no less attractive, from the numerous purple veins which intersect each other, over the entire surface of the lip, which has a cream-coloured ground. In texture it is strong and leathery, and the surface is wrinkled and uneven. Around the orifice of the tube, the colour is an intensely rich velvety purple, which contributes much to the beauty of the flower. With all these recommendations, however, the blossoms are not without a deteriorating quality, for they have a strong and extremely disagreeable odour, resembling that of putrid flesh, and which is quite as strong as in the *Stapelia grandiflora*, the well-known carrion-flower. As it is a climbing plant, and the blossoms are produced on the young shoots, and consequently near the roof of the house, this is not so great an objection as in the *Stapelia*, where they are in the lower part of the house. The plant, too, from its extreme luxuriance of growth, is only suitable for a large stove, where the unpleasant smell will be less powerfully felt than in the confined atmosphere of a smaller structure. The foliage is abundant and heart-shaped, and, like the flower, is also large. The stem is deeply fluted. It was introduced to the Garden of the Horticultural Society some years since, from Guatemala, and a cut specimen taken from a plant flowering in the Society's Collection was exhibited at the rooms in Regent-street in the early part of the month.

Bego'nia a'cida. This is a species remarkable for thick, fleshy leaves, covered with a hoary, woolly substance, which, however, easily rubs off, especially on the upper surface. The stem is stout and strong, of a woody nature, and similarly clothed with wool, though of a browner colour. The panicles of flowers are supported on stalks nearly a foot long. The flowers are about the size of *B. semperflòrens*, and of a clear and spotless white. It is blooming in the collection of the Horticultural Society.

Bego'nia papillo'sa. Another species, also flowering in one of the stoves at the Horticultural Society's Gardens, at Chiswick, but with a more luxuriant habit and more lively foliage than the last. The leaves are also much larger, and are very soft to the touch, the under side being densely clothed with small hairs. The flowers are disposed in loose panicles, and, like the foliage, have the under or outer surface of the petals covered with small hairs.

Brachyse'ma platy'ptera. Messrs. Henderson, of Pine Apple-place, have a good specimen of this plant in flower. There is much dissimilarity in the form of the leaves, some being broad and ovate, whilst others are long and lance-shaped. They are of a dry, rigid texture, and a deep, shining green colour. It grows freely, and branches abundantly, and the crimson flowers are borne, three or four together, from the axils of the leaves. To have good plants, they should be grown in a heathy soil, and placed in a warm greenhouse, where they must be plentifully supplied with water during the summer.

Cattle'ya. A magnificent member of this delightful genus of Orchidaceous plants has recently flowered in the nursery of Messrs. Rollisson, of Tooting. It was received by them about five years ago from La Guayra, but has never produced any flowers till the present season. Probably it is a variety of *C. labiata* or *C. Mossiæ*, but it is easily distinguished from the plants of those species in cultivation, by its slender stem-like, pseudo-bulbs, which are not so stout, and much longer. The leaves, also, are narrower in proportion to their length. The flowers, too, are something larger, the petals measuring three inches and a half in length, and being of a proportionate breadth. Like many of the larger-flowering species it has a copious spot of rich purple on the lip.

Choroze'ma specta'bilis, *var.* So long as this plant remains destitute of flower, there is nothing to induce any one to suspect it to be anything but the true *C. spectabilis.* It is in all respects similar, except in having the orange-coloured upper petals variegated with specks of white. It was obtained from the Continent by Mr. Jackson, of Kingston, who has now a flowering specimen in his nursery. Probably it is an accidental variety, raised from seed. As it is a quick-growing plant, with extremely slender shoots, it is well adapted for training to a basket or a trellis.

Dendro'bium pulche'llum purpu'reum. A variety, received by Messrs. Loddiges, of Hackney, from Rajabassa, some years since, with petals of a deeper purple tint, and a brighter and more distinct orange spot in the centre of the lip. It has the same gracefully pendent habit, and profuse flowering disposition as *D. pulchellum.* Few Orchidaceæ are better suited for introducing as an ornament to a drawing-room: for, combined with an elegant growth and attractive blossoms, it is gifted with the property of being able to accommodate itself to an extensive gradation of temperature. When the atmosphere is not too moist, the colours retain their depth and distinct character, and continue in perfection for a longer period in a cool place, than when permitted to remain in a stove.

Dillwy'nia tenuifo'lia. This does not differ much from others of the same genus in the flowers, although it is materially distinct in the general figure and habit of the plant. The leaves are very small, and numerous, of a heath-like character. The branches are slender, scarcely strong enough to support themselves, and bend outwards with a graceful curve. Small twigs or spurs, an inch or two long, grow from the main shoots, and terminate in clusters of orange and red flowers. It is a New Holland species, and does not appear to require any particular treatment, beyond that usually bestowed on hard-wooded greenhouse plants. We saw it flowering in the nursery of Messrs. Henderson, of Pine-apple Place.

Echi'tes hirsu'ta. The honour of introducing this species belongs to Messrs. Veitch & Son, of Exeter, and, although not equal to other species which they have imported, it is by no means contemptible. It has a rambling twining habit, and will be useful for training round conservatory pillars, or it may be grown in a pot, and fastened to a wire basket. The blossoms are produced in clusters, and have a large spreading limb, of a pale cream-colour, the throat being streaked with orange-red. The whole surface of the tube is clothed with white hairs, very closely arranged. The twining stems and the leaves are also hairy. A well-grown plant is in flower in a greenhouse at Mrs. Lawrence's.

Ho'vea trispe'rma. A beautiful species of *Hovea* is flowering at Messrs. Henderson's under this title. It is a weak-growing kind, and will consequently require a little attention to keep it from becoming naked and unsightly. It has bright, lively, violet-coloured flowers, not unlike those of *H. splendens*, which was figured some months ago. A basket would probably be the best support for the shoots, which might be trained loosely over it.

Kenne'dya monophy'lla, *var.* Another plant which Mr. Jackson of Kingston has received from the Continent, and also flowering in the Kingston nursery. Like the *Chorozema*, it is chiefly remarkable on account of variegatum ; but in this plant it is in the *leaves*, which have large irregular blotches without colouring matter ; and to increase the singularity of their appearance, no two leaves on the plant are variegated alike. Some are almost entirely without colour, others are nearly all green, and whilst the colourless portion is at the margin of one leaf, it is in the middle of another.

Milto'nia cunea'ta. We perceive that Messrs. Rollisson's new *Miltonia*, which we noticed last month, is described by Dr. Lindley, under this name, in the Botanical Register.

Pime'lea hyperici'na. This is one of the best species in cultivation, but, although it has been in the country several years, and is not more difficult to grow than others of the genus, yet it is rarely seen in collections. Specimens are flowering with Mr. Low, of Clapton, and Messrs. Lee, of Hammersmith. From other species it is readily distinguished by its leaves, which are much like those of *Hypericum perforatum.* With a little attention to stopping the main shoots, to promote the production of a greater number of laterals, it may easily be preserved in a bushy and neat form, and will develop an increased quantity of its erect semi-globular heads of white flowers, with long, deep orange-coloured anthers rising above them. All *Pimeleas* require to be freely watered during the growing season, and to have the heads of flowers removed as soon as their beauty fades.

Phyce′lla chlora′ca. A bulbous plant found growing on rocks near Saragura, in Mexico, by Mr. Hartweg. It has a flower-stem a yard high, and crowned with a cluster of gracefully drooping flowers, which are more interesting from the pleasing combination of colour, than for their magnitude. The principal part of the tube is crimson, having green tips, partially overspread with a bluish bloom, and beyond which the yellow anthers protrude. It requires warmth to grow it well.

OPERATIONS FOR MAY.

May is universally allowed to be one of the gayest months of the year. The rapidity with which spring has unfolded her verdant garb, is only equalled by that with which, throughout the coming month, as she ripens into summer, she displays the varied tints of her flowery mantle. The culturist now begins to reap largely the fruits of his labour; and the degree of energy he has exerted, and the care and skill which have marked his operations, will now be effectually exposed. But it is not alone in the review of the past, or in the contemplation of the beauties of the present, that his mind must be occupied. The fading flowers, which daily afford him a little occupation in removing, afford him at the same time a hint of the necessity of exertion to supply a succession, since those now only expanding will in a short time share the same fate.

In order to prolong the season of a favourite flower, much may be done in many cases, and especially with respect to those species which have a natural tendency to develop their blossoms during the early part of summer, by pruning or stopping the growing shoots of a few specimens, and thereby inducing them to form lateral shoots, which may flower at a more advanced period. A judicious regard must be observed in practising this to the peculiar habit and nature of the plant operated upon, as well as to the vigorous or weakly state in which it exists. The species to which alone these remarks can be referrible, are those which produce their inflorescence on the shoots of the current year.

Beyond the advantage of a lengthened season of flowering, there is another benefit arising from the practice, which has claims of equal importance upon our consideration. This is the addiional profusion with which the flowers are afterwards produced, each lateral being equally prolific, as the portion of the shoot removed would have been had it remained; thus, in the place of one, there will be two or three or more flowers, or heads of flowers, according to the natural disposition of the species.

A more compact habit is also promoted by shortening the growing shoots, and that, too, without any material present loss of accumulating parts. And wherever the application of the principle may be necessary or desirable, it should always be performed early, so that the smallest possible amount of the growth already made may be destroyed. If the correction of a straggling growth, and the attainment of more symmetrical proportions, be the chief object aimed at, then t is not necessary that it should be confined to plants which flower on the young wood.

But it will be useless, and, indeed, mischievous, to shorten the shoots promising flower, in the xpectation of being rewarded for the delay, by an increased development of blossom at a later period, if the plants so treated be in the least stinted in the quantity of nutritious matter supplied o their roots. The additional number of growing points will require a proportionate increase of ood to support them. If the space in which the roots are confined be so circumscribed as to ause them to become crowded, the plant should immediately be provided with a pot of more mple dimensions. This must never be neglected or delayed, or the growth will be puny and weak, and if flowers are produced, they will be more scanty and deficient in magnitude than those eveloped under more attentive management.

The period of flowering may also be prolonged, and the quantity and size of the blossoms increased, by carefully removing the earliest flowers as soon as their beauty begins to decay. The profitable tendency of a continuation of this practice, so long as a withering blossom remains, will be satisfactorily evidenced by the comparatively unimpaired health and vigour of the plant, when contrasted with one which has been permitted to form and mature its seed ; and even though the plant should evince no disposition to form seeds, cleanliness and order demand the instant removal of fading flowers. Nothing betrays a slovenly character, and a contempt for order, more fully than the neglect of this point. The only exceptions to its observation that can be admitted, are when seeds are desirable either to perpetuate the species or to raise new varieties, or when the fruit is showy and attractive.

Shrubby plants of weak growth, which naturally make long shoots, too frail to support themselves, will be much improved by bending down the shoots, and attaching them to a wire fixed round the rim of the pot. Although they may look unsightly for a few weeks after being treated in this manner, they will, eventually, make more pleasing plants. The nakedness of the branches at their base will be hidden, and the check imposed on the ascent of the sap will induce buds to push at the bend, and fill up the centre of the bush.

Greenhouses must be freely ventilated both day and night, whenever the state of the weather will permit. Even if a slight frost be expected during the night, the lights should be left partially unclosed as late in the evening as is consistent with the security of the plants. Too high a temperature during the night not only causes the production of long slender shoots, but weakens and lessens the development of flowers, and also hastens their decay. At the same time, it is equally injurious to run into the opposite extreme ; a sickly and diseased habit being frequently the consequence of an insufficient degree of warmth. Strong currents of air must be guarded against in houses and pits containing tender leaved and soft-wooded plants ; in heath-houses, on the contrary, within certain limits, they will be beneficial.

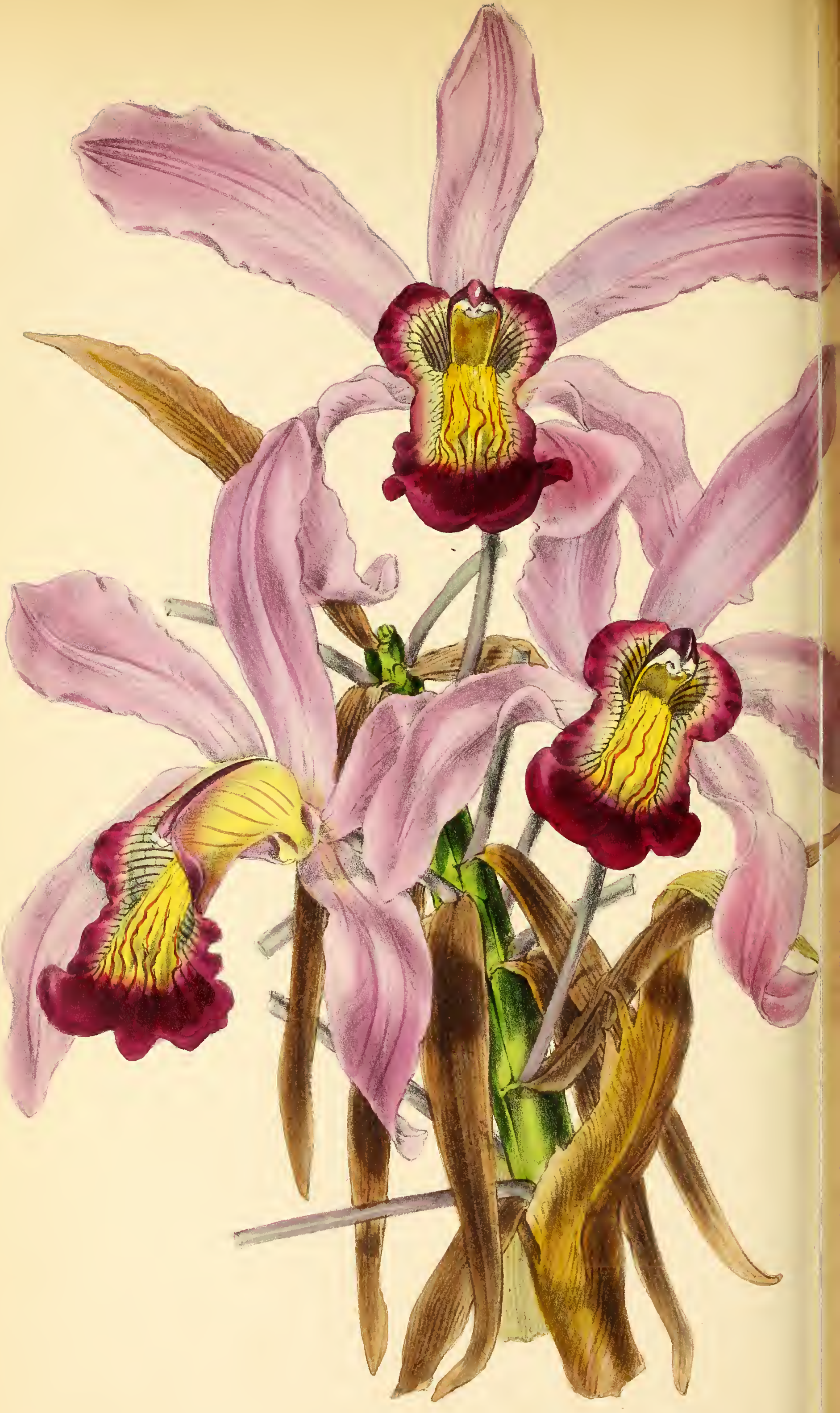
Water must be administered freely to all plants in vigorous growth, and in sufficient quantity at each application to moisten all the soil about them. But if any are in an unhealthy state, it must be more sparingly applied. And, in addition to watering at the root, it will also be useful to syringe them every evening in dry, sunny weather, observing not to wet the expanded flowers.

In the pleasure-ground there will be abundance of work. All the more tender border plants that the uncertainty of our climate would not permit to be planted out last month, must now be got into the ground. There is seldom much danger after the middle of the month, but it will be advisable, even then, in cold and unsheltered situations, to be prepared with some protecting material for those most susceptible of injury. In planting out *Dahlias*, a peg about a foot long and the thickness of an ordinary stake, should be stuck into the ground with each plant. By using this precaution, the roots will not be injured when stakes are required, which cannot be avoided when no place is reserved for the stake.

The progress of weeds must always be arrested as soon as possible, for if they are once allowed to overrun the ground, and shed their seeds, it will require almost endless labour to eradicate them. Economy is best studied in prompt attention. Never let the advantage of dry, sunny weather pass by without improving it.

As the pits and the frames are emptied of their winter occupants, they should be appropriated to the production of flowering specimens for the greenhouse and stoves. *Achimenes* and all the tribe of *Gesneraceæ* should be grown here. *Cockscombs, Balsams, Thunbergias*, &c., must be brought forward as rapidly as practicable, and no place is better suited to promote their growth than pits. A strong stimulating soil, plenty of pot-room, and an abundance of water, together with a moderate bottom heat, are requisites inseparable from their successful cultivation.

Erratum.—By a mistake in the reference to our memoranda, we published a figure, last month, of Messrs. Lane & Son's *Nerium*, under the name of *Tanglé*. It should have been *Nerium Oleander Rayanot.*



S. Holden del. & Lith.

Lælia superbiens.

LÆ̀LIA SUPÉRBIENS.

(Stately Lælia.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDÀCEÆ.

GENERIC CHARACTER.—*Sepals* explanate, lanceolate, qual. *Petals* larger, slightly dissimilar. *Labellum* ree-parted, lamellate, wrapping over the column. *olumn* winged, fleshy, front surface channelled. *nthers* eight-celled. *Pollen-masses* eight. *Caudi-ulæ* four, elastic.—*Lindley.*

SPECIFIC CHARACTER.—*Plant* an epiphyte. *Pseudo-ulbs* elongated, swollen in the centre, channelled, slightly compressed. *Leaves* rigid, shining, sharp-pointed, about the length of pseudo-bulbs. *Scape* erect, very thick and strong. *Bracts* ventricose, acute, sheathing the scape. *Flowers* numerous at the extremity of the scape. *Sepals* linear-oblong. *Petals* obtuse, broader than the sepals. *Lip* three-lobed, shorter than petals. *Column* arched. *Anthers* furnished with a two-eared crest. *Clinandrium* with indented edges.

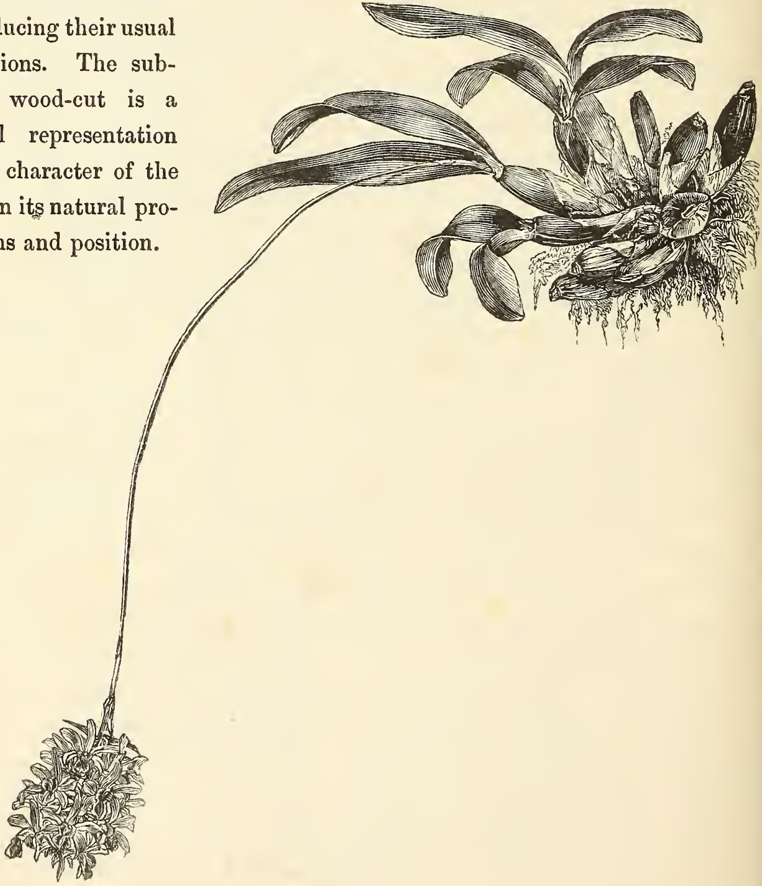
THE admirers of Orchidaceæ have to thank the Horticultural Society of ondon for many of the most splendid plants of the tribe which they possess, and specially among those of South American origin. The beautiful family of *attleya,* and its kindred genus *Lœlia,* have been greatly augmented by the dustry and zeal of their collector, Mr. Hartweg, who gathered and sent over to e Society a great number of species, and amongst them the present. As it was rwarded in considerable quantity, it has found its way into many collections. r. Skinner has also the merit of having introduced it very extensively.

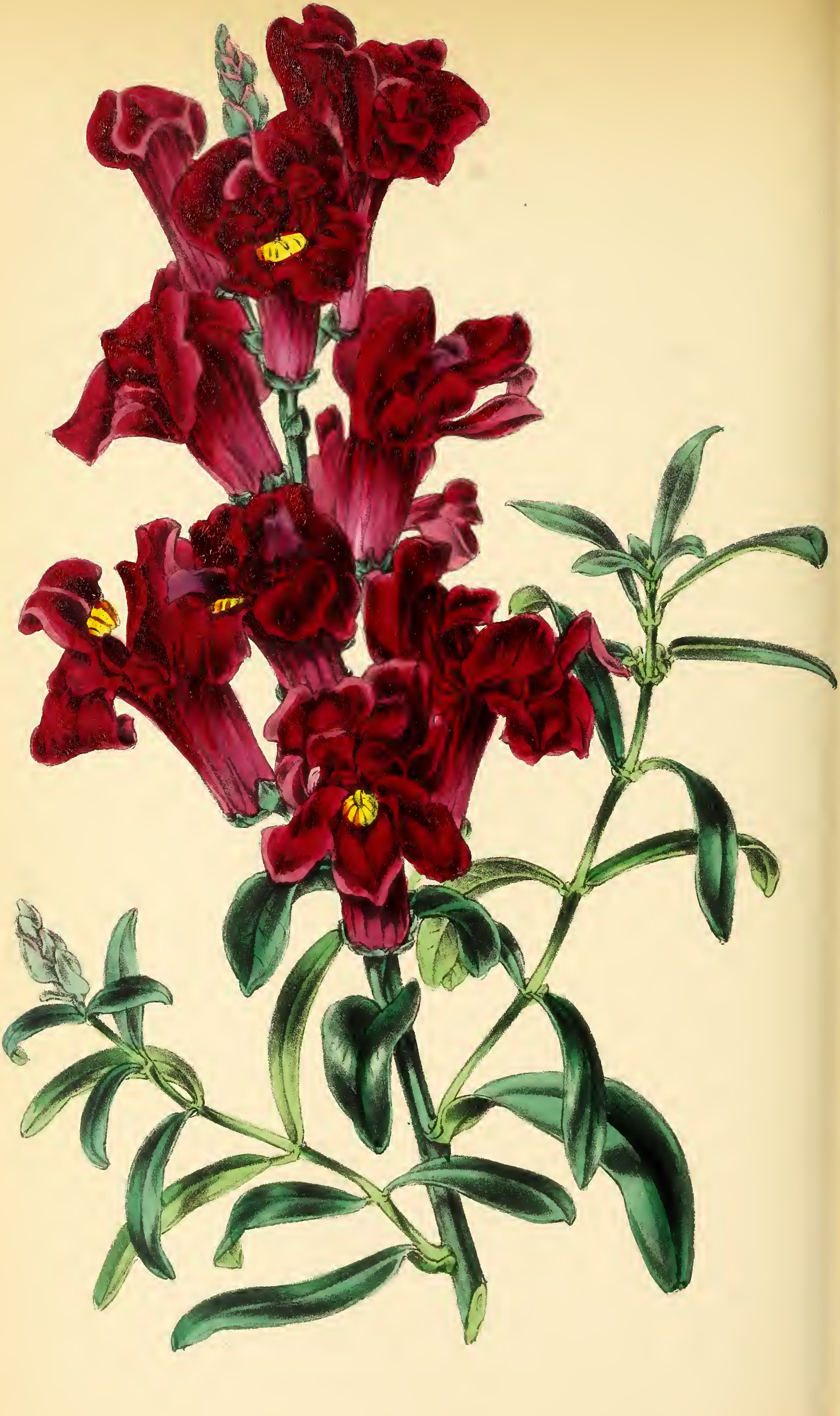
Till the present season, however, its flowers have only been known in this ountry through dried specimens, and the plates given in Mr. Bateman's superb ork on Guatemalan Orchidaceæ. About the latter end of February last, howver, a fine specimen grown by Mr. Brewster, gardener to Mrs. Wray, of Oakfield, ar Cheltenham, was exhibited at the rooms of the Horticultural Society, and om which we were kindly permitted to prepare the accompanying coloured figure. nother specimen, but less perfect, has since flowered in the Society's gardens.

We learn from Mr. Bateman's work, just alluded to, that it is found growing t of the crevices of the rocks in the cooler districts of Guatemala, chiefly in aces which are sheltered from the keenness of the northern winds. In such tuations, the pseudo-bulbs sometimes grow twenty-two inches high, and have wer-scapes four yards long, crowned with upwards of twenty flowers. This mense size, however, is far from being common; and when the plants are not otected on the north side, they are very small, and have an imperfect stunted appearance. In England the flower-stems have been about six feet in length, and the pseudo-bulbs usually rise about a foot.

Probably the reason why flowers have not been produced sooner, may be correctly assigned to the fact of the specimens which were first introduced having been subjected to a high temperature, with a close, moist atmosphere. These conditions being more favourable to luxuriant growth, would undoubtedly militate against the production of flowers. And it was not till the plants which have bloomed were treated in a contrary manner, that they displayed any appearance of flower. *Cattleyas* and *Lælias* should always be grown in a lower temperature than is required by East Indian genera; and, during their winter season, water should be carefully withheld, and no moisture allowed in the house that can be prevented.

The immense size of the flowers precludes the possibility of our giving more than two or three without reducing their usual dimensions. The subjoined wood-cut is a faithful representation of the character of the plant in its natural proportions and position.





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Antirrhinum majus flore pleno.

ANTIRRHÌNUM MÀJUS FLÒRE PLÈNO.

(Double blood-coloured Snap-dragon.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
SCROPHULARIÀCEÆ.

Generic Character.—*Calyx* in five oblong perma-ent segments. *Corolla* ringent; turned or elongated to a spur at the base; upper lip cloven and reflexed; wer obtuse, three-lobed, with an elevated palate, llow underneath. *Capsule* roundish or oval, obtuse, o-celled, bursting unequally at the summit. *Seeds* merous, roundish, angular, or winged.

Specific Character.—*Plant* perennial, suffruticose, with a leafy branched stem. *Leaves* opposite or alternate, lanceolate, acute, smooth, entire. *Flowers* in dense clusters, beset with ovate bracts. *Calyx* unequally five-cleft, ovate, concave. *Corolla* with a rounded prominence at the base. *Seeds* black and wrinkled.

Var. Flore pleno.—Fine deep sanguine double flowers.

Some time ago we figured one of the most striking of the many garden varieties, hich the long-continued increase by seeds has been so successful in producing. hat variety, *A. M. caryophylloides* is peculiar for the rich and distinct colours of s bizarre blossoms. We have now the pleasure of introducing another variety of different character, but no less charming and deserving.

Double flowers are not a new thing amongst Antirrhina, but they are exceed-gly scarce. We find mention made of one cultivated in the gardens of the rench, in *Le Botaniste Cultivateur* of M. du Mont de Corset, a work published any years since, but no remark is given relative to its colour. We have also seen uble rose-coloured varieties, but we believe that the present is superior to any t obtained in the depth and richness of its purple-crimson blossoms.

The extreme prolificacy and the facility of increasing Snapdragons, together ith the little care required in their culture, and their highly ornamental flowers, ve obtained for them an acceptable standing in most gardens. And now that e almost endless variety of colour which they display, of every intermediate ade from the deepest crimson to the purest white, some discrimination in the oice of the most deserving appears to be in a high degree requisite. And we are rsuaded that the double-flowered variety delineated on the opposite page, with rich-coloured flowers, and repletion of petal, combined with the intensely dark ssy foliage, will obtain a place amongst the most conspicuous.

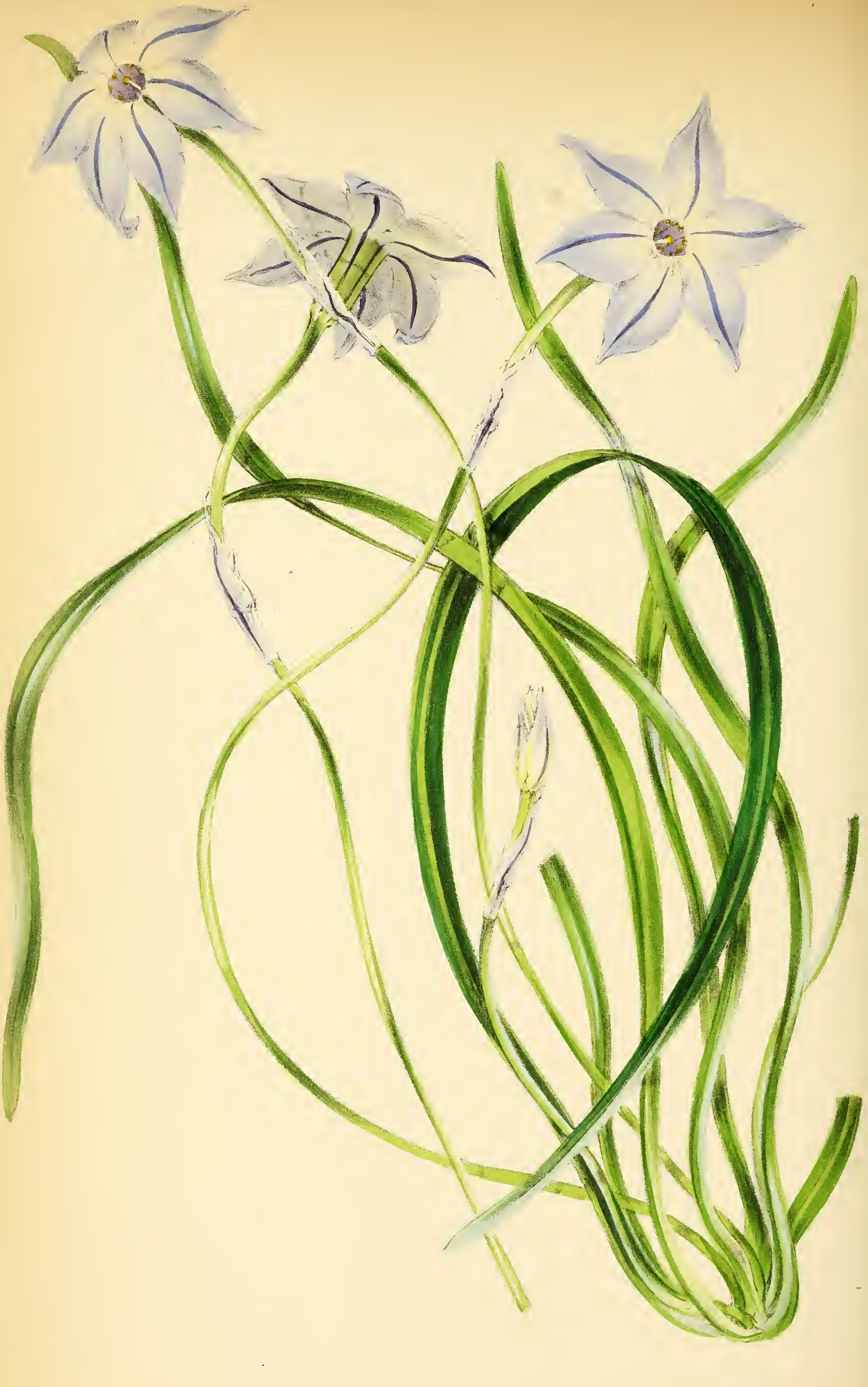
It was raised accidentally from seed in the nursery of Messrs. Young, of

Epsom, and our figure was taken from a plant which bloomed in the grounds of those gentlemen in July, 1842. It is almost unnecessary to add that the small size of the plate would not permit us to depict a cluster of the usual magnitude, and we have therefore been obliged to content ourselves with one much below the ordinary standard.

Perhaps, as a means of promoting the production of superior varieties, it may be useful to hint at the extent of the genus, and the number of species of a very distinct nature which might be employed to fertilise the seeds of *A. majus*, with great probability of a successful result.

If it be objected to allow these plants a place among the rarer beauties of the flower-garden, we would yet urge their pleasing and showy properties as worth the cultivator's attention to enliven the rockery, or some of the wilder parts of the pleasure ground. And indeed it is in rocky, barren ground, in dry gravelly situations, among stones and rubbish, where few other plants will acquire any excellency, that these plants are seen in the greatest perfection; and it is only in such situations that they endure without injury the severity of winter. When grown in wet and damp places, or in too rich ground, they are exceedingly liable to rot and die away in the winter months.

The best plants are always obtained from seeds, which may be sown early in spring, and transplanted before they become too crowded. They will generally flower in the same year. But to perpetuate varieties like the present, recourse must be had to cuttings, which root freely under a hand-glass, or even without any other protection than a mat to shade them from the sun. As soon as the plants have ceased blooming let the flower-stalks be removed, and in the spring when young shoots begin to form, the old branches must be cut away within an inch or two of their origin. By such treatment the plants will always be preserved neat, and the branches will be less liable to break, than when allowed to grow year by year without pruning. The flowers will also be finer and more abundant.



J. Holden del & lith

Leucocoryne ixioides

LEUCOCORỲNE ALLIÀCEA.

(Garlic-scented Leucocoryne.)

Class.
TRIANDRIA.

Order.
MONOGYNIA.

Natural Order.
ASPHODELÀCEÆ.

Generic Character.—*Perianth* salver-shaped, limb six-parted. *Stamens,* three fertile, rising out of the tube, three sterile, fleshy, terete, rising from the throat of the tube opposite the segments of the perianth. *Hypogynous scales* none. *Ovary* sessile, three-celled, many seeded. *Style* terete, articulated with the ovary. *Stigma* simple.

Specific Character.—A bulbous perennial. *Leaves* long, linear, smooth. *Flowers* with a greenish-white streaked tube, and a limb deeply divided into six segments, nearly equal, acuminate, blue. *Peduncles* very unequal.

Some of the species of *Leucocoryne* are better known to cultivators as Brodiceas, under which head they were first arranged and described. From that genus, however, they have been separated by Dr. Lindley on account of the difference in the insertion of the fertile, and the texture of the sterile stamens; and the present name, derived from *leukos* white, and *koryne* a club, has been applied in allusion to the form and colour of the barren anthers.

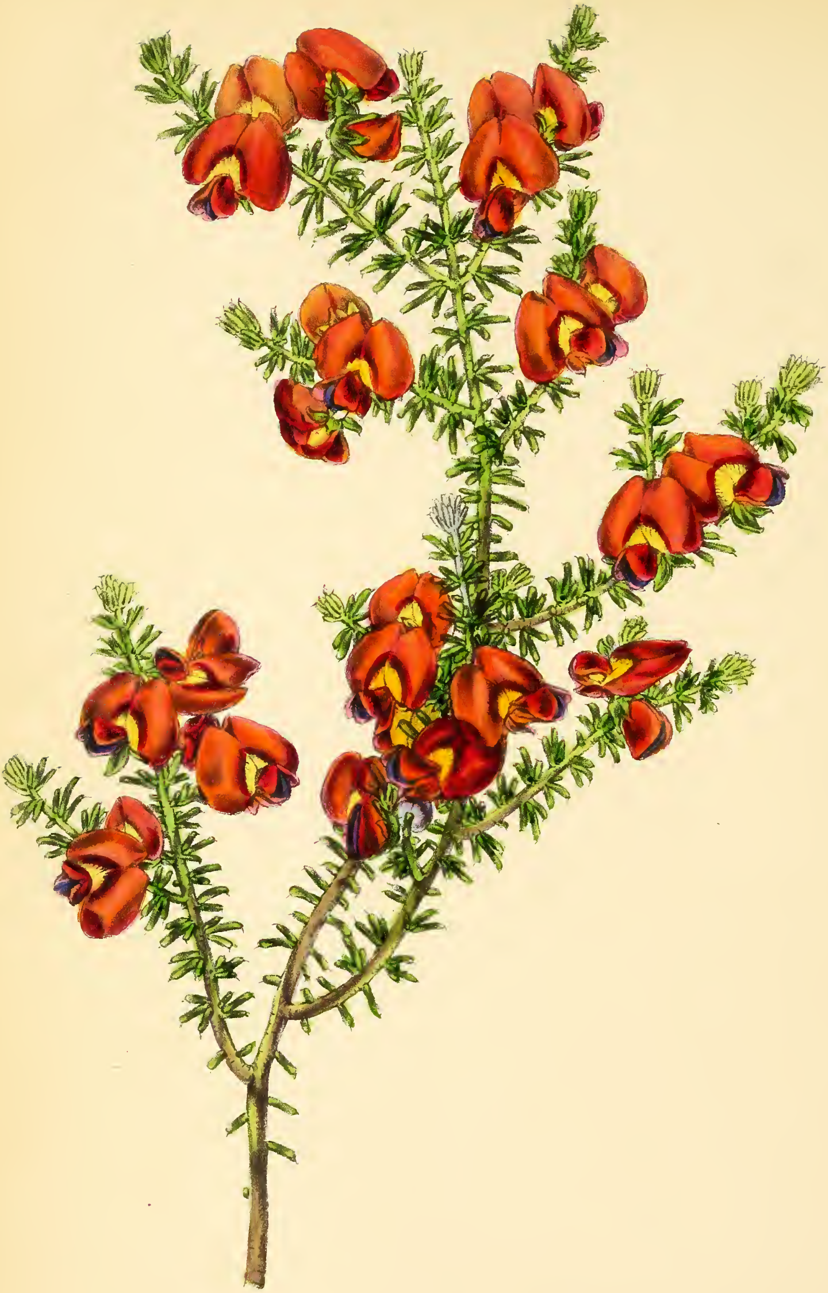
For the opportunity of bringing forward the present species, we are indebted to Mr. Hislop, the intelligent gardener to Colonel Howard, at Ashtead Park, near Epsom, who kindly sent us a flowering specimen in the beginning of April of the present year. He received it under the name of *B. ixioides*, but it is evidently not the same species which has been figured under that name in the *Bot. Mag.*, and which is described as having the spreading divisions of the flower of a green colour tinged with violet, whilst in our plant they are of a delicate lilac blue.

Although not a new plant, having been in the country for several years, it is rather scarce, and considering that it admits of being increased with great facility, flowers freely, and possesses a colour which is comparatively rare and universally pleasing, its rarity appears a little extraordinary. Seeds are produced in great abundance and ripen well, thus providing an almost indefinite means of increase.

In the greenhouse it is a desirable acquisition in the early spring months, especially as blue flowers are rather scanty. But it is equally adapted to adorn the window of the cottager; and Mr. Hislop informs us that it has even been grown with success in the open ground without any protection. If its hardihood should be established by repeated experiment, it will be a useful plant for the flower-garden in spring, and there is no doubt that if started in frames, it might be turned out with perfect safety at an early period.

A note which appeared in the *Bot. Reg.*, some years ago, states it to have been found in Chile, in 1825, by Mr. Mac Raie, together with *L. odorata* and *L. ixioides*, growing on the sides of the mountains between St. Jago and Valparaiso, in places that a few days previously had been covered with snow.

The specific appellation is extremely applicable, from the strong garlic scent which is emitted whenever any part of the plant is broken or bruised. It will consequently be necessary to be careful not to injure it, as the unpleasant odour is not experienced under other circumstances.



S. Holden del & Lith

Gompholobium Hendersonii

GOMPHOLÒBIUM HENDERSÒNII.

(Messrs. Henderson's Gompholobium.)

Class.
DECANDRIA.

Order.
MONOGYNIA.

Natural Order.
LEGUMINÒSÆ.

Generic Character.—*Calyx* five-parted, nearly equal. *Keel* of two concrete petals. *Vexillum* broad. *Stigma* simple. *Legume* many-seeded, nearly spherical, very blunt.—*Don's Gard. and Botany.*

Specific Character.—*Plant* an evergreen shrub. *Stem* erect, rigid, slightly angular, verrucose. *Leaflets* three, linear, wedge-shaped, recurving at the margins with a mucronate reflexed point. *Calyx* in five ovate segments, downy on the inner surface. *Keel* smooth.

The tribe of papilionaceous flowering plants from Australasia, are now become the chief ornament of the greenhouse, for it is upon them that it must principally depend for a showy and interesting appearance. The varied order of their inflorescence, and the difference in habit which they display, are great recommendations. Even the form of the flowers, though all partaking of a similar character, presents a peculiarly pleasing variation.

The subject of the opposite drawing belongs to a genus extremely elegant and ornamental. *G. polymorphum* is probably the most universally known of any of its members, and is remarkable for the tenuous gracility of its stems, and the bold and conspicuous arrangement of its beautiful blossoms, and it is also a plant of quick growth and easy culture. *G. Hendersonii* possesses a character which differs widely from this, though it is no less distinguished for beauty. Instead of shoots remarkable for great length and tenuity, it is, on the contrary, a small dwarf bush, of a slow growth, and very stiff rigid habit, approaching more nearly to *G. ericifolia.* The leaflets are small and narrow, always ternate, whilst those of *G. polymorphum* are sometimes three and sometimes five. The flowers are scarcely so large, but are produced in equal abundance, and near the extremity of the shoots.

Seeds were sent over by Captain Mangles from the Swan River in 1840, from which plants were raised in the following spring. Our drawing was made, in the autumn of 1842, from a plant which flowered in the nursery of Messrs. Henderson, of Pine-apple Place.

Considerable skill and attention is necessary to preserve this species, and indeed many of the slow-growing New Holland plants, in a healthy growing condition. It is one of those delicate-rooted plants which are so extremely susceptible of injury from the careless application of water. Nothing is more likely to prove fatal than either to allow the soil to become too dry, or to maintain it in a wet and sodden state. At each application sufficient water must be given to moisten all the soil contained in the pot. Slight waterings, though often repeated, are not so beneficial as one copious application; as the surface of the soil alone becomes moist, and the great bulk which surrounds the roots of the plant, and on which it is chiefly dependent for nourishment, remains almost as dry as before.

A peaty soil of a fibrous nature, with a trifling admixture of loam and sand, should be chosen, and in potting, sufficient drainage must be employed to provide a ready escape for superabundant moisture. And as this is a plant which never rambles or grows large and luxuriant, it must not be planted in too large a pot. Immediately after potting, it should be placed in a close frame, and kept shaded from bright sunshine, till the roots have taken hold of the fresh compost.

The great difficulty experienced in inducing cuttings to strike root still prevents the plant from becoming common or even generally known. Cuttings must be chosen from the young wood just as it begins to acquire firmness, and they should be planted in sand, the pot plunged in a slight bottom-heat, and covered with a bell-glass.

The specific designation is given in compliment to Messrs. Henderson, of Pine-apple Place.

GARDENING AS A SCIENCE.

VEGETABLE PHYSIOLOGY.—No. V.

THE *vascular system* of plants now claims attention, and in commencing our remarks, we at once disclaim any pretensions to explain what are called *Elementary organs:* we know not anything of *elements* in organization; but, as in plants more or less mature, we can trace a system of vessels and cells, all of which, it is certain, must be essential in performing vital functions, we can only presume that in extremely young and immature subjects, the organs termed *elementary* are, in fact, *rudimental,* the miniature representatives of what they will ultimately become: the analogy throughout organic life is herein, we believe, perfect and complete.

Keith, in his *Physiological Botany*, has some very pertinent remarks, which now apply. "It is," he observes, "much more likely that the rudiments of all the different parts of the plant do already exist in the embryo, in such specific order of arrangement as shall best fit them for future development, by the introsusception of new and additional particles, than that the vital principle shall first manufacture a membrane, which it converts into *cells*, which are afterwards partially and accidentally converted into *tubes*, and the plant so patched up. For if this were the fact, there would be no such thing as saying what species of plant any particular seed might produce, when committed to the soil." Vol. II, 203.

The *vascular system* of plants comprises a system of vessels which M. Mirbel arranged under five heads; he it was, who originally advocated the theory so justly criticized by Keith; and as further researches have led to new discoveries, we will cursorily run over the arrangement now adopted by Lindley in his Elements of Botany.

1. *Cellular tissue*, composed of little individual vesicles, cohering together, according to the position in which they are placed.

2. The Cells, so arranged, contain fluids; and, in fact, all the laborated, specific fluids of the plant or tree: according to Knight, *it is by the cells* that the sap ascends, nd not by the tubular passages which were originally called sap-vessels.

The *Cells* of the leaves contain the Chlorophyll, or colouring matter. *Starch (Amylum)* is deposited in cells, and of this singular substance that of the Potato ffords the most familiar example. The following very interesting particulars we collect from a Prize Essay (published in the Journal of the Royal Agricultural Society), by Dr. Fownes—*On the Food of Plants.*

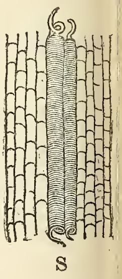
"Starch is found abundantly in nearly all the tissues of plants: stem, leaves, oots, seeds, are occasionally charged with it also, almost, in appearance, to bursting; t is only necessary to instance the common potato, grain of all kinds, the roots of he Orchis and Arum, as examples. When these are torn to pieces by grating, nd placed in a trickling stream of water, the starch is washed out of the cellular issue which contained it, and, on the water being allowed to stand, settles down as a silky, white powder, which, under a lens, exhibits the appearance of rounded, transparent, colourless granules, the magnitude of which varies very much with the plant from which they were obtained."

Microscopic observers are at variance on many points, but all seem to agree, however, that each granule is enclosed in a membranous covering.

"When starch is put into cold water, and the temperature gradually raised to the boiling point, this membrane gives way, as if by the expansion of the matter within; solution takes place, and a translucent jelly, familiar in the common arrow-root, is produced." Vol. IV. part II. 505.

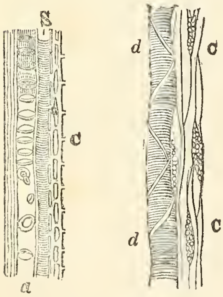
If starch be boiled slowly, and for a considerable time, in a little diluted sulphuric acid, it is converted into sugar, of the variety termed *Sugar of Grapes;* the sulphuric acid suffering no change whatsoever.

2. *Woody tissue* consists of longitudinal tubes or fibres, the rudiments of the matter of the future wood.



3. *Vascular tissue*, of which the *spiral* vessels or tubes are the type. They are found in the medullary sheath, in the veins of the leaves, but rarely in the wood or bark. If a young, green twig of elder be cautiously broken, these spirals will be drawn out; and, infinitely fine and delicate as they are, they are sufficiently strong and elastic to sustain a piece of the twig half an inch long, and thicker than a crow-quill. This true, original spiral vessel, contained within masses of cellular tissue *(Parenchyma)* is represented at *s* of the annexed figure.

"*Ducts*" is a term recently introduced for those "transparent tubes, the sides of which are marked with rings, bars, or transverse streaks. They are slight modifications of the spiral vessel, differing principally in being incapable o unrolling; and, in some cases, in the turns of the spiral fibre being distant or broken, or even in appearance branched."—(*Elem. of Botany.*)



Ducts, it should appear, comprise all those vessels which, some years ago, were classed among the modifications of the spirals, and termed *punctuated*, *annular*, and *reticulated* vessels. In a wood-cut of a publication on vegetable physiology, by the Society for the Diffusion of Useful Knowledge—never completed—they were thus figured;—*S* is the spiral or supposed type *a,* the annular vessel, or most simple modification; *c c* portions of the cellular tissue; *d d*, a punctuated or dotte vessel, with irregular, distant spiral threads. The *reticulated* or netted vessel, was stated to be found in few plants, one o which is the balsam at its full growth, and chiefly in its roots

These vessels were considered as conduits of the ascending sap; but thoug all of them may, at times, contain fluids, it is more than probable that the opinio of Mr. Knight, before mentioned, is correct; this, however, is not the plac to offer any remark upon the functions of organs; their actual existence and structure requiring to be proved before we have any just pretension to define their offices. That the microscope can, and does detect variations, there can be little doubt. The true *spiral* may be observed by the aid of one of Ross's single botanical microscopes; and, indeed, its coils will be seen by the unassisted eye. The following passage, from a later Treatise by the same society, may conduce to some very gratifying investigations.

"Spiral vessels are generally seen by learners in an unrolled state, which is the most easy to obtain, but the worst calculated to give a correct idea of their real nature. One of the best modes of seeing them is to take a piece of asparagus as it is brought to table, and to tear it to pieces in water. By means of a little tearing and cleaning, you may extract from the pulp,—which is cellular tissue,—a quantity of fibrous bundles, which are in part woody fibre, and in part spiral vessels; the elasticity and disposition to unroll, in the latter, being destroyed by the boiling, they may be easily separated in an entire state, when the true position of their internal fibre will be distinctly perceived."

The experiment is easy, but the expression, *internal fibre*, requires observation. The true spiral tube—if we mistake not—is composed entirely of a fine, closely-compressed coil of membranous thread; the elasticity of which is, doubtless, lost by boiling;—but the expression, internal fibre, implies that the coil itself is inclosed by a tube, of which it forms a subsidiary member. Now there are tubes or vessels, so composed, and these constitute the *reticulated,* and *punctuated ducts.* Microscopes of excessively high power, those through which light passes, and transfers the object to a screen, may, perhaps, ultimately lead to some correct discoveries; but, in the present state of knowledge, the student, with such instruments as are usually at his own command, will find cause of hesitation at every step; he will perceive optical delusions, appearances upon which he cannot satisfactorily confide; yet we may venture to assert that, as respects the true spiral, the evidence will be decisive, that it is simple in its construction, though the spires may adhere together, and form a perfect tube till they become unrolled.

The above have been considered as forming the system of vessels which conduct the ascending fluids; Lindley names a series which is termed *Laticiferous Tissue,* whose office is to convey a peculiar coloured fluid, called *latex,* to all the newly-formed vessels: they are identical with the proper vessels of the old writers. This issue is confined to the *liber,* or inner bark of exogens chiefly; it appears to be ntermediate with the system of vessels which return the laborated fluids from the eaf back to the plant, and which, therefore, were called *Reducent* vessels. These onstitute the simple tubes of Mirbel.

The best theory we meet with, which, after all, amounts to little more than onjecture, is the following:—

The returning vessels have their origin in the leaves; the sap-vessels are closely ccompanied by them in each rib of the leaf, but they separate in the foot-stalk at its junction with the twig, the sap-vessels passing from the central part of the latter, while the returning vessels enter into the bark of the twig. In the Elder, five sets of returning vessels, that is, one for each leaflet, are discernible in the bark of the foot-stalk, and thence they pass into the bark of the twig and stem.

Whatever may be conjectured concerning a kind of circulation of the vegetable fluids, a phenomenon stoutly denied by many, certain we are, that there are vessels which connect the leaves with the plant, and that they ramify in proportion to the figure, simple or compound, of the leaf. When we come to consider the functions of the several organs, more will be said to throw some feeble light upon a structure which involves the greatest difficulties, and which will become still more apparent when it is seen that all our means and methods of observation are antagonist to the natural processes of vegetable life.

Note.—The reader is requested to substitute the words "*a Creation*" for "an expansion" at line 13, p. 84, of the last article.

FLORICULTURAL ŒCONOMICS.

Having largely discussed questions of gardening economy in our last volume, it might be expected that we should now leave our readers again undisturbed on such matters. But the topic is one of such extreme amplitude, and so prolific in details which affect the interests of all concerned in Floriculture, however humble may be their patronage of the art, that we consider it necessary to revive it in our pages, and present it in various fresh points of view, or at least, with reference to different operations and practices.

The ordinary and amazingly lavish waste of manure in most establishments may seem to be a question that more concerns the agriculturist or the kitchen-gardener than the grower of flowers. An extravagant construction of the well-known truth, that superfluous manuring tends to the production of exuberant branches and foliage rather than blossoms, has led many into the belief that manure is of itself, in a general way, inimical to the highest ends of Floriculture; and while the florist, or cultivator of those flowers which have been immensely improved by judicious hybridization, perceives the necessity for using manure liberally, in order to maintain the elevated characters he has elicited; the more extensive grower of tender exotics often yet continues to discard manure from his compost, under the vague impression that it exerts a bad influence on flowering propensities.

Since, however, it is clear that the florist could alone carry on his great improvements, or even perpetuate those he has already obtained, by the free use of manuring substances; and since the growers of those splendid objects which so enchant us at our great floricultural exhibitions, are equally generous to the majority of the plants under their charge, in reference to some kind of manure;

the inference is tolerably certain that manures constitute an important item in the list of articles to which the flower-cultivator owes his success, as much as the vegetable-grower and the farmer. And hence, it is of great value to know the profuse expenditure of those essential qualities which give efficacy and virtue to any sort of manure, may be in great part prevented; the expenditure we refer to being the exhalation of the more valuable gases by exposure to the atmosphere.

Manures easily class themselves into two divisions—the natural and the artificial, though these are frequently blended, and may be so treated with considerable advantage. The natural manure, obtained from animals, or from animal or vegetable substances, is the old-fashioned application, which has been used from the earliest times. Earthy or mineral matters, in their natural state, may likewise be ranged beneath this section. The artificial manures are those modern compounds which swell the advertising columns of our newspapers, and which are produced mainly by a variety of chemical combinations. The union of the natural with the artificial is effected by applying a variety of chemical or other preparations to natural manures, for the purpose either of retaining or developing their properties.

Now, as a general observation, we may affirm that the last class of manures is decidedly the best. And it is with the view of showing how naturally fertilising substances may be rendered far more efficacious, that we have at present broached the subject.

In regard to artificial manures, experience has so strongly shown that their effects are comparatively transient, and that they are so exceedingly liable to adulteration, even though the most satisfactory analysis of any portion of them may be procured, that, while we are writing, we believe there is almost a unanimous determination among practical men to revert to their old fertilisers, and only to bestow more care and exhibit more science in the preparation of these. Guano, as a perfectly natural product, when pure, is of course excepted from such statements, and this is probably one of the very finest of our manures.

Persons of a fastidious taste would, almost without fail, at once decide that the artificial section of manures was more fitted for applying to flowering plants, because of their more refined (or, if we may use the expression, ethereal) character. Grosser substances seem unsuitable to the delicate mechanism which is to develop flowers alone. But the slightest reflection, and reference to the most common practice, will show the baselessness of such views. Those exquisitely beautiful and delicate things which the florist rears to such perfection, are mostly supplied with the strongest and grossest of manures. The excrement of birds, animal blood, and other like powerful matters, are very generally used by florists for the greater portion of their plants. And while facts are thus against such refined notions, however pleasurable, no one would contend in their behalf.

But it is quite possible to render the commonest and most disgusting manures as comparatively free from all that is offensive, as those of artificial creation; and thus the most delicate taste might be accommodated.

We must proceed, however, to the main object of our remarks—the best modes of economizing the fertilizing powers of manures, and so putting a far better aspect on the products of the flower-garden and plant-houses at a much less cost.

The principal power of all manures lies in the peculiar gases or salts which they contain; and the manner in which these things are lost is by exhalation, consequent on exposure to the air. All the effluvia arising from a manure heap is, in fact, its essential virtue; and the escape of this must, of course, materially weaken the good properties of the manure. Half the decayed stable refuse which is generally used for manuring ground, is destitute of nearly all power as a fertilizer, and acts mainly in a beneficial way, by helping to pulverize the soil and keep it open.

It is, therefore, the great question, in preparing manure of this kind, how those properties which act as nutriment to plants can be best retained, and prevented from evaporating.

By far the most simple method of accomplishing this, is to keep the manure constantly covered over with some material that would absorb the ammonia, and interrupt its passage into the atmosphere. In almost all frame grounds, and places where stable litter is employed to furnish heat, and where, consequently, the cultivator has to go for the bulk of whatever manure he may apply to his plants, this manure, even while it is fermenting, is mostly seen in an uncovered state, some parts of its surface being more or less exposed to the air. And when heat is no longer required from it, heaps are made of it, or it is left lying about till it is needed for use. As a matter of course, besides losing much of its heating power, it wastes a large proportion of its nutritiveness. In addition to which, if it remain thus during the spring or part of the summer, nearly the whole of its virtue is exhaled, on account of the increased action of the atmosphere upon it at those seasons.

When, again, the same kind of manure is taken to the compost-yard, and left lying there for a long period prior to being used in the preparation of soil for potting, or for filling borders, the continued action of the sun upon it abstracts the greater part of its strength, and it then becomes chiefly or entirely serviceable for its porousness, and for the open character it gives to the compost.

Nothing can be easier than the counteraction of these evils. A layer of dry litter, weeds, other rubbish, or even clay, spread over a dung-bed or mass, or over the linings to a frame, would cut off nearly the whole of the action of the atmosphere upon it, and keep in the essential properties of the manure. The same application would also be appropriate for a heap of manure in the compost-yard or shed; only it would be better to cover with earth alone, choosing a rather strong kind of loam. The latter, by imbibing the gases from the manure, would become an excellent soil for strong-growing plants.

Such are the simple measures by which every cultivator might save yearly a considerable portion of manure, and, what is of much more importance, he would hereby get a manure of such a far more concentrated description as to render his lants infinitely better than they could be by any amount of a poorer material vhich he could otherwise apply : for, where a limited compass does not admit of large application of manure in point of bulk—and such is unavoidably the case, or most part, in plant cultivation—it is of prime moment to get a more concen-rated form, and yet not one which is too powerful, or which does not combine he mechanical with the chemical uses.

We just allude, in passing, to the last particulars here mentioned, because one f the chief errors in respect to manures, at the present time, is the forgetfulness hat their value must be partly of a *mechanical* nature. In refined processes, such s the pot and border culture of flowers, this is especially true. Manures, herefore, which do not tend to keep the soil more open and light than it would therwise be, are of less value than those which accomplish this object. And thus will be seen that the old-fashioned stable dung possesses even a more valid ecommendation than its being little liable to be adulterated.

But another way in which manure may be economized, and its best constituents aved from waste, is by careful expedients for collecting all the fluid which soaks way from manure heaps, from beds of fermenting matter, or from dung linings. his is seriously neglected in the majority of gardens. If only for cleanliness, very frame-ground or compost-yard ought to be most thoroughly drained, and all he superfluous fluid conducted into an underground cistern, which, both for onvenience and for the prevention of exhalations, should be well covered in. In his receptacle, more of the real essence of the manure would be collected han is ultimately obtained from the whole of the manuring substance itself.

Although we have above spoken of the desirableness of consulting mechanical gency in selecting manure, yet, in flower cultivation, after the substance intended r manure has been applied, and in part exhausted by the plant, it is often xtremely necessary to administer fresh nutriment ; and as this can alone be done y mulchings or by fluids, the former expedient being too unsightly, the latter must f necessity be adopted.

Liquid manures are always of great use to the plant-grower, on account f their immediate effect ; since, if substances be employed, their qualities have to e taken up by the fluids applied, and so presented to the plant, whereas a liquid already in a fit state for its reception, and finds its way at once to the spongy arts of the roots.

In the husbanding, then, of the true virtue of manure by keeping it covered ver, and in appropriating all the powerful fluid which flows from it in whatever osition, we conceive that the culturist will be doing himself a most inestimable rvice, and saving much expense, besides gaining his ends in a far better manner. hat manure is indispensable to first-rate culture, we think is readily demonstrable, nd we may avow our conviction that it will rapidly become a staple article in plant rowing of almost every description.

The retention of the ammonia in manure by chemical applications, is a matter with which every one is now getting familiar; and, for this reason, we do not discuss it. Unfortunately, there is too great a tendency to take up novel and scientific methods of doing many things, while simpler measures are lost sight of, merely because they would occur to the most ordinary mind, and require no ingenuity, or knowledge, or care, in the execution. Last, therefore, though we would be to do anything but hail the glorious progress of science, we feel it advisable, in the present day, to recal attention to the most common-place matters that seem to be concealed by the learned theories and prescriptions now propagated.

There is one circumstance relative to economizing manure which should not be omitted. It is the desirableness of applying it in winter or in early spring, in conformity with the usual custom. If put on before the sun gets too powerful to dry it, and to exhale its strength, it will be worth nearly twice as much as a fertilizer.

Nor must we, while speaking of saving manure, overlook the frequent waste of heat which occurs in the preparation of leaf-mould. This may probably be regarded as a sort of manure. At any rate, it is a good substitute for it in the culture of many exotics. And as the heat from fermenting leaves is of the most genial character, being particularly well suited for furnishing any kind of bottom-heat, it is bad policy to make up a mass of leaves, and leave them to ferment and rot of themselves, without using them as a source of temperature. Such a plan entails both the total loss of the heat so generated, and a loss of time in the process of decay, as well as the probability that the decomposition will not be so satisfactory. Water should, however, be freely thrown over fermenting leaves, which are otherwise apt to get too dry and consume.

From the magnitude of the tract over which the subject of gardening economy extends, we shall take up other portions of it in one or more of our ensuing numbers.

THE WHITE FORGET-ME-NOT AS A BORDER FLOWER.

Because many beautiful plants are natives of Britain, and may be met with in a wild state in some parts of the country, they are often disregarded, and their cultivation as objects of ornament is wholly neglected. Such a practice will not, however, bear the test of sound philosophy; for where intrinsic merit exists, it matters little to a correct taste whether it be obtained from a British meadow or a tropical jungle. Indeed, the love of country ought to make the latter more desirable, if it be equally worthy of esteem.

We have lately noticed a charming little perennial herbaceous plant in cottage-gardens, and in the collections of some of the less fastidious wealthy cultivators, which is in every way so deserving of culture that we wish to make known its merits. It is, we believe, the *Myosotis arvensis alba*, (called in some places

Myosotis alba,) which is not mentioned in the first edition of Loudon's catalogue, and is described in the last supplement as a garden production; so that it seems to be of comparatively recent origin.

It is a most rapid and free-growing plant, readily multiplied to almost any extent by division at the roots, and extending itself all the more vigorously from being repeatedly separated. It flourishes in any garden soil, and nearly in any situation. But perhaps it thrives best where it only receives the morning or evening sun, and not the full meridian summer blaze.

About the end of April, this charming plant begins to open its numerous blossoms, which are of a pure white, and look like so many little snowy stars. The blooming season is continued uninterruptedly till the month of September, and sometimes later.

It is an admirable plant for putting in patches along the borders of shrubberies, and in those other pleasure-ground borders or beds, where a mixed collection is grown. It would also form very pretty beds or masses, where the dimensions of these are not too great; for the flowers are rather too small for general effect in large plots.

But while it is pre-eminently fitted for growing in open ground borders, it is ikewise of considerable service as a pot-plant, for keeping among a collection of potted Alpines, or for introducing to the greenhouse, or show conservatory. On any low stage it has an enchanting appearance, because the quantity of flowers gives it such a gay sprightly air.

As a plant for forcing, too, it has great recommendations. No plant could orce more easily, and the profusion of its pretty blossoms renders it very desirable or the early show-house, or for the drawing-room window. Its very affinity to the common Forget-me-not, and its resemblance to that delightful plant in all hings except colour, give it an additional charm.

And this brings us to notice the true Forget-me-not, (*Myosotis palustris,*) which s even much more ornamental than the one we have been describing. As a border lower, it possesses the highest characteristics, and only requires planting in a moist oil, slightly sheltered and shaded, to become a truly brilliant object. It is, moreover, an equally good foreing plant, very valuable for bouquets, as every one dmires it; and fit alike for windows, for greenhouses, for borders, and for beds. The lovely blue tint of its almost perennial flowers is extremely pleasing; and few of our most cherished exotics can vie with it in interest. Besides, under favourable ultivation, its blossoms increase in size to the extent of nearly one-half.

The principal thing to be attended to in cultivating these two beautiful plants s to divide them nearly every year, and give them a fresh position; and, when the pikes of flowers begin to lengthen out, by the decay of the lower blossoms, and he upper ones degenerate in size, the whole spike should be cut off, to make way or fresh developments. This, by further preventing the production of seeds, will ecure a very long display of bloom.

CURSORY REMARKS.

Culture of Gardenias.—The cultivation of these plants, well known for their beautiful and highly fragrant flowers, appears to be generally much neglected, except in the gardens of those who grow them for sale, or for cut flowers, the demand for which, in the metropolis, appears to be considerable. It is singular that they should be so indifferently grown in private gardens, especially as their management is not attended with any difficulty, nor do they require anything beyond the practical application of those principles which are now become so well recognised amongst cultivators. The great success realized by metropolitan growers appears to be owing in a large measure to their giving them a state of periodical repose and excitement. This is effected by keeping them during the winter season, or after they have perfected their growth, in a cool greenhouse, to which no more fire-heat is applied, than just sufficient to preserve the temperature a few degrees above the freezing point, and to dry the house in damp weather. During this period very little water is given to the plants, and this is right, because the plants are not forming any growth, and very little is required for the support of that already completed. As soon as the buds begin to swell, the plants are well watered and removed to a pit or frame, with a gentle bottom-heat, from fermenting dung or tan. In this place they will not require much water at the roots at first, as the moisture from the heating material, and an occasional syringing in sunny weather, will be almost sufficient. As the flowers begin to expand the amount must be increased, and the plants, if required, may be taken to the greenhouse, or to an intermediate house to display their bloom ; and when the flowers are no longer ornamental, removed to a close frame to mature their growth. Potting may be performed either before they are placed in bottom-heat, or not till after the flowers are all faded. A strong loam, with about a third part of leaf-mould, is a better compost for them than peat. When it is not convenient to place them in a pit, they may be tolerably well grown over a cistern of warm water, or in other similar situations, always bearing in mind that they require a slight bottom-heat, and a close, moist atmosphere whilst, swelling their flower-buds, and making new wood, and the opposite treatment during their season of rest. If the plants are old, or have become stunted through improper treatment, or neglect, it will be better to obtain young ones in a healthy condition, than to persevere in endeavouring to correct the effects of previous bad management. Cuttings are easily struck in sand, under a bell glass, and soon make bushy flowering plants. *Gardenias* also force well ; and, by removing a few plants into hea at different periods, a constant succession of their deliciously fragrant flowers may be produced throughout the whole of the spring months.

Ventilation of Pits and Frames.—Removing the lights from frames and pits is frequently objectionable in rainy or windy weather, and the glass is often damaged when they are raised a the back for the admission of air. Instead of this, small ventilators, to run in grooves, may be fixed in the back and front of pits immediately under the wood work. They may be constructed either of wood or metal, but *slate* is much the most suitable material, as it neither swells nor contracts to a sensible degree by the variations of temperature. The grooves for the ventilators to run in, should also be of slate. All the ventilators should be connected together by an iron rod so that they may be shut and opened at once. Frames may be constructed with small ventilators in a similar manner, or they may have one of the boards about 4 inches broad, the whole length of the back and front, left so that it may be retained or removed at pleasure. These may be fastened with catches and hinges, or they may merely be bolted at each end, or they may run in grooves like those of the slate ventilators for the pits.

Heating Apparatus.—Much has been said lately on the tank system of heating pits and houses and also on the open gutter system. These methods are connected in the arrangements for warming a range of pits in one of the metropolitan gardens. The pit nearest the boiler is fitted up with tank 5 inches deep, covering the entire surface, and the other two pits are heated by gutters. Th water flows through the front compartment of the tank in the first pit, and passes along the gutte in the front of the second and third pits, and returns by the back gutter through the other divisio of the tank to the boiler. It is also so contrived, that if heat is not required in the third, or secon and third pits, the water can be prevented from passing through them, and made to return alon ie back of the others. This is effected by iron plates, similar to the dampers used in smoke flues. 'he tank is covered with slate an inch thick, and the floor of the gutter-heated pits is constructed f wood, pierced with numerous holes about an inch in diameter. The chief advantage of the comination of these systems of heating, consists in obtaining a different temperature in two pits from ie same boiler, as the greater heating surface of the tank will always maintain the first pit at the ighest temperature. And by only permitting the water to circulate through the gutters of the iird pit during frosty weather, or during excessive damps, the three pits may be rendered equiva- nt to a stove, a greenhouse, and an intermediate house.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS.

BE'RBERIS TENUI'FOLIA. A rare Mexican species sent by Mr. Hartweg to the Horticultural ociety, and found by him on the eastern declivity of Orizaba, at an elevation of 3000 feet above ie sea, where it grows on the outskirts of the forests, and frequently attains the height of ten et. "Considering the warm climate of which it is a native, it was expected to prove tender, nd the event has proved it to be so; for we have no species yet in our gardens so impatient of old. In fact, it must be regarded strictly as a greenhouse plant to which any amount of frost ould be fatal. It is a hard-wooded, graceful plant, very apt to run up with a single stem without roducing lateral buds." The flowers are agreeably fragrant, and are borne towards the close of ie year, from October to Dec. *Bot. Reg.* 26.

BOLBOPHY'LLUM CALAMA'RIA. "An exceedingly curious *epiphyte* belonging to the genus *Bolophýllum*, as now defined; but Professor Lindley contemplates constituting a new genus of this nd some others." It was received by John Gray, Esq., of Greenock, from Sierra Leone, "and iough not a very showy plant, the beautiful structure of the flowers, and the rich blood-coloured ift of hair on the elongated lip, entitle it to a place in every tropical orchidaceous collection." 'he flowers are arranged in a crowded spike, at the end of a scape a foot long. *Bot. Mag.* 4088.

CATTLE'YA INTERME'DIA VARIEGATA. The sporting character of the species of many Orchidaceous enera is especially exhibited amongst *Cattleyas.* "The present one has the elongated pseudoulb, the narrow leaves, and the lamellated labellum of *C. intermedia;* but the sepals and petals re much broader, the middle lobe of the lip is white, and the *lamella* red. It was sent from razil, by Mr. Gardner, and flowered in the stove of the Royal Botanic Gardens of Kew, in Iay, 1843." *Bot. Mag.* 4085.

CE'REUS PITAJA'YA. This has been long cultivated in the Royal Botanic Gardens of Kew, under ie name here retained, and is a very handsome species, growing erect, bearing very large showy owers, (white or cream-coloured,) and with stems of a singularly glaucous green tint. There is uch difficulty in determining the synonyms of this *Cereus.* Pfeiffer appears to have changed e old specific name conferred by Jacquin, solely on account of the variable character and he as included under it two figures of Plumiere, which appear extremely different in habit from his plant, and from each other, and he refers the *Cèreus undulòsus* of De Candolle hither, which described as having spines two inches long; while on the other hand, he keeps the *C. obtùsus* f Haworth distinct, which seems too nearly allied to the present." "Our plant is described as an ihabitant of Carthagena; but Pfeiffer adds Mexico, Peru, Brazil, and the West Indies. Its oble flowers are produced with us in July, generally expanding towards evening, and fading in he morning of the following day." *Bot. Mag.* 4084.

CYMBI'DIUM PE'NDULUM *var.* BREVILA'BRE. "As far as our experience goes, the ordinary ariations to which Orchidaceæ are subject, are in all respects analogous to what is met with in ther plants, and as is exemplified in the plant before us from Sincapore, in which, while the lip ecomes shorter, broader, and with a much blunter middle lobe, everything else remains so exactly ie same, that nobody can entertain a doubt about the specific identity of the plant with *Cymbíium péndulum.* The vertical plates of the lip, in particular, are quite unchanged, showing, as we find it always shown, that the elevations and processes of the surface of the lip are of the utmost consequence in considering the limits of species. It was received by Messrs. Loddiges from Mr. Cuming, who found it at Sincapore." *Bot. Reg.* 24.

Drymo'nia puncta'ta. "Introduced by the Horticultural Society, from Guatemala, through the medium of their collector, Mr. Hartweg. It is cultivated in the Royal Botanic Gardens of Kew, to great advantage, in a wire basket, with pieces of wood and turf, and suspended from a beam in a moist stove. In such a situation it thrives admirably, and bears its delicate yellowish, or almost primrose-coloured flowers, dotted with purple, copiously. As a species it is very different from the *D. serrulata* of Martius, (*D. bicolor* of Lindley,) in the shape and marking of the flower, in the short peduncle, and especially in the narrow, not cordate, base of the sepals." It is a plant of a somewhat herbaceous character, having fleshy stems and leaves, and singularly fringed and spotted flowers. *Bot. Mag.* 4089.

Eria bracte'scens. "Among the extensive genus *Eria* we find a few species particularly distinguished by their short fleshy stems, and the membranous-coloured bracts which accompany their hairless flowers. Of these the best known are the present species, *longilabris, obesa,* and a Philippine plant that may be called *ovata.* They are natives of the hotter parts of India, and are so much alike that an incautious observer might almost regard them as varieties. They are, however, most truly distinct." *E. bractescens* was found at Sincapore by Mr. Cuming, and by Mr. Griffith in Burma, near Moulmain, and is a very interesting little species when closely examined, but the flowers are small and not very showy. "It has a fleshy oblong stem, which bears at the summit two or three leaves, from one and a half to two inches broad, and gradually tapering to the base. Its flowers are in the Sincapore plant greenish white, with a lip crimson, except at the end; in the Burma plant they are more straw-coloured than green. The lip is three-lobed, has an abruptly truncated extremity, and is marked with three elevated ridges, of which the two side ones are very short, while the middle one reaches to the end of the lip." *Bot. Reg.* 29.

Greeno'via au'rea. "The genus *Greenòvia* was founded in the *Phytographia canariensis* upon the present species of *Houseleek*, discovered originally in the Canary Islands, by Christian Smith. The name was given in honour of George Bellas Greenough, Esq., the celebrated geologist and enlightened patron and promoter of useful knowledge." "The true *G. aurea* inhabits the woody region on the rocks called Los Organos, in the valley of Orotava, above Aqua Mansa, in Teneriffe, and at Mount Saucillo, in the Grand Canary, where it was found by Despréaux. The beautiful zone of *Laurels*, on the outskirts of which it is found, drips with continual moisture from the clouds floating on the surface of the trade-winds, and which are arrested in their progress southwards by the lofty mass of the island." The habit of the species greatly resembles that of some of the European Houseleeks. The flower-stem grows a foot or eighteen inches high, and is clothed with leaves, gradually becoming smaller towards the top, and surmounted by a cluster of starry yellow blossoms. *Bot. Mag.* 4087.

Hibiscus Cameroni-fulgens. "A specimen of this plant was sent us in August, 1843, by Messrs Rollisson, of Tooting, who state that it is a hybrid, between *H. Cameroni* and *H. fulgens.* *H. Cameroni* is a Madagascar shrub, with heart-shaped five-lobed leaves, buff flowers, with five deep crimson spots in the eye, and a very small involucre; *H. fulgens* is a garden name for a variety of *H. Rosa Sinensis.* The produce of these two is the very handsome variety now figured, which as might have been anticipated, proves worthy of so beautiful a parentage. We presume it to be a stove shrub." (There is a good prospect of realizing pleasing results from crossing *H. Cameron* with other species, as it is one that produces seeds freely, and is very distinct in character.) *Bot. Reg.* 28.

Lindle'ya mespiloi'des. "This plant is an evergreen tree of small size, looking very much like *Mespilus grandiflorus*, but with flowers as sweet-scented as the Hawthorn bloom." The genus *Lindleya* and its allies form a peculiar group of *Rosàceæ*, "remarkable for their capsular fruit and winged seeds: the latter a circumstance not hitherto observed in other plants of the order in our gardens. *L. Mespiloìdes* seems likely to prove about as hardy as an *Escallònia*, but no more so. Its fine evergreen foliage, and large sweet (white) flowers, render it very desirabl that it should be able to bear our climate." It remains in flower about a month or six weeks The figure was taken in the Horticultural Society's Garden in July 1843. Mr. Hartweg found i welve to fifteen feet high, at the natural bridge called Puente de Dios, 45 miles N.E. of Real del Monte, above 6500 feet above the level of the sea. "It also occurs sparingly near the Hacienda le Santa Ana, in the State of Oaxaco, always preferring a dry chalky soil." It may be grafted readily on the *Common Thorn,* and the larger kinds of *Cotoneaster.—Bot. Reg.* 27.

Maclea'nia Longiflo'ra. "This is one of the numerous fleshy-rooted vaccinaceous shrubs frequently met with in dry and exposed situations on the Andes; the present species has been collected on the main Cordillera, near Loxa, (4° S.), at an elevation of about 8000 feet above the sea, where it forms a neat compact evergreen shrub, 5 feet high, and is called by the inhabitants *Salapa.*" "It is very near *M. angulata,* figured in the *Bot. Mag.* 1. 3979, and said to be from Peru. But that species has shorter and broader leaves, with manifest stalks, and the flowers are also shorter, contracted at the orifice, and yellow there. Their colour, too, is represented as much more vivid than in our species." It requires a warm greenhouse. *Bot. Reg.* 25.

NEW OR INTERESTING PLANTS FLOWERING IN THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

Angulo'a ——? A plant is blooming in the collection of S. Rucker, Esq., who received it from Mr. Linden a few years since. It has very large pseudo-bulbs, and the leaves are broad and slightly plaited. A scaly scape, about ten inches long, issues from the base of the pseudo-bulbs of the preceding season, bearing a single flower, with sepals and petals of a greenish yellow, copiously spotted on the inner surface with small specks of brownish crimson. The lip is curiously formed, and is divided into three lobes, the middle one being very small, covered over with hair, and having a deflexed point; whilst the edges of the other portions stand up, forming a sort of boat-shaped dish. A singular prominent transverse plate rises upon the surface near the end, and has beneath it an opening that extends some distance towards the base of the lip. A strong perfume is exhaled, bearing some resemblance to that yielded by *Maxillària aromática.* Owing to the large dimensions of its leaves and pseudo-bulbs, it will require to be planted in a large pot, and may be subjected to the same treatment as other genera allied to *Maxillària.*

Aza'lea indica, *var.* Several handsome hybrid varieties are flowering in the collection of Mr. Knight, of Chelsea, among which the following are especially deserving of notice. *Exquisita,* a large flower, with numerous carmine spots on a rich pink ground, with an irregular edging of white. It is much in the way of *variegata,* but has the colours better defined, and the flowers are usually produced in large heads. *Optima* is a fine-shaped flower, having the petals well rounded, and of a strong texture; the colour is a reddish orange, and the spots are very rich and distinct. *Refulgens,* a fine free-blooming kind, with rich dark scarlet flowers of great size: it is scarcely so distinctly spotted as the preceding. *Splendida* has a purple flower, with firm round petals, and dark-coloured spots. *Præstantíssima* bears blossoms rather smaller and paler than *Optima,* very distinctly dotted.

Cirrhope'talum chine'nse. All the *Cirrhopetalums* are very interesting and curious plants when closely examined, and many are also very showy. The articulation of the lip with the lengthened base of the column, is so slight and delicate, that the least breath of air gives them an oscillating movement, which is, however, more remarkable in some species, though peculiar to all. In the present, which Messrs. Loddiges had the pleasure of introducing from China some years ago, it is very strikingly displayed. The flowers are neat, and all radiate from a centre; the outer or lower petals being greenish yellow, and more than three times the length of the inner or upper ones, which have a dull yellow ground colour, minutely spotted, and tipped with a rich purplish crimson. The lip is very small, of a pale livid hue, and only remarkable for the dancing movement just alluded to.

Cirrhope'talum aura'tum. Another species, with flowers spread out in the form of a fan, and having the two outer petals of a dull blood colour, gradually becoming paler towards their extremities. The other petals are very minute, and clothed with a few long scattered hairs. The foliage is small and green, and the flowers are arranged at the end of a long nodding scape. This was also obtained by Messrs. Loddiges, about the same time as the last, from Manilla.

Cirrhope'talum candela'bra. Singular as the two species above noticed are, this is yet more so. Instead of having the flowers disposed in a fan-like form, they are arranged in a circle round the head of the scape, and the pink-coloured outer petals assume a downward direction, adhering together by their margins, and forming a kind of balloon. So closely do the petals adhere, that without very minute investigation, and separating them one from another, a person would imagine them to be all one. The upper petals are straw-coloured, and streaked with strong lines of a brownish purple hue. The labellum has a fringed margin, and is of an amber tint, tipped with yellow. The leaves differ considerably from those of the other two species, being much larger, and purple instead of green. To grow these plants successfully, they should be planted in a pot filled with light turfy peat, or they may be attached to a block of wood, with a little sphagnum, or fern root, to cover their fibrous roots. A warm moist atmosphere is indispensable during the growing season ; but when at rest they must be kept much cooler, and comparatively dry. This species was also received by Messrs. Loddiges from Manilla.

COMAROSTA'PHYLLIS ARBUTO'IDES. A beautiful half-hardy *Ericaceous* shrub allied to *Arbutus*, with branched spikes of cream-coloured blossoms, in which a very slight and delicate shade of pink is suffused. It has a woody stem clothed with leaves of an elliptical form, with entire margins, quite smooth on the surface, and of a leathery texture. The colour is deep green on the upper side, and silvery white underneath. It is one of the many new plants that the Horticultural Society of London have lately introduced, and a specimen from the Gardens at Chiswick was exhibited a short time since in Regent-street.

CONETERO'STYLOS BRACTEA'TA. Seeds of this plant were received in 1841, from the Swan River, by Messrs. Rollisson, of Tooting, from which two or three plants were raised the same season, and are now flowering abundantly. It is a soft-wooded shrub, with hairy cordate leaves, and a stem beset with numerous fasciculated tufts of small, slender, bristly hairs. As the internodes are rather lengthy, and the leaves by no means large, it has a light, airy appearance, almost too scanty of foliage. The leaves alternate on each side of the stem, and towards the end of the branches, a long, slender, forked raceme issues opposite to each, bearing a number of small rather thinly disposed blossoms, divided into five narrow-pointed pink segments. The darkened centre of the flower is chiefly occupied by five almost black stamens, arranged round the elongated pistillum, as in *Thomasia*, a nearly allied genus. It is a plant which ought not to be planted in a very large pot ; and it may be grown in any greenhouse, taking special care that the night temperature is kept low. If exposed to too much heat, the space between the leaves will be increased, which would be injurious to the appearance of the plant.

CYRTOPO'DIUM PUNCTA'TUM. A noble specimen of this rarely flowered, yet magnificent species was exhibited at the Botanic Gardens, Regent's Park, from the gardens of Sir George Staunton. It had several stems nearly six feet long, clothed with sword-shaped leaves arranged at short intervals on each side. Eight flower-scapes rose up amongst them, on which the beautifully spotted yellow and crimson blossoms appeared in dense clusters. It was grown in a very warm and moist stove.

DENDRO'BIUM DEVO'NIANUM. Messrs. Rollisson, of Tooting, have a small plant of this most lovely species with twelve flowers on one stem. The handsomely fringed, yellow spotted, and purple-margined lip, so fragile and delicate in texture, render it exceedingly attractive. The blooms endure for a long period suspended in a drawing-room.

DENDRO'BIUM HEYNEA'NUM, *var.* A handsome variety with delicate pink flowers is blooming in the nursery of Messrs. Loddiges, of Hackney. The hairy palate of the labellum is of a deeper orange, and the markings of the upright portion are also more strongly streaked with purple. The spikes are slender and reclining, and each consists of 16 or 18 flowers. The stems are always destitute of foliage till after the flowering season has gone by. It appears most attractive when fixed to a piece of wood, and suspended from the roof.

GONGO'RA TRUNCA'TA. In the collection of Mr. Rucker, this new species, sent to him by Linden, is producing flowers, on drooping racemes eighteen inches or two feet long. These have a glistening yellow and white lip, and cream-coloured sepals and petals. It should be planted in a basket depending from the roof of the house, so as to be near the eye. The basket should be filled with rough pieces of fibrous peat, or the decayed root stocks of ferns, in preference to sphagnum moss.

OPERATIONS FOR JUNE.

THE hurry and bustle created by the numerous operations which constantly urge themselves n the attention, and call forth the whole energies of the cultivator in the earlier months of the ear, will now have partially subsided. The great works of spring, such as potting, sowing seeds, roviding plants, and executing plans for the embellishment of the greenhouses, the lawn, and he parterre, during the ensuing summer, will be in an advanced stage towards completion : there vill consequently be more leisure to attend to minuter details, and to improve general appearance y greater attention to individual parts.

Frost need no longer be feared ; for the ground has now acquired heat sufficient to render us retty secure from its occurrence. All provision which has been reserved for security against njury from this foe may be safely removed ; and this ought always to be one of the first perations of June, unless extraordinarily unfavourable weather should render their retention lesirable for a week or two longer. It is always objectionable to retain anything that can be voided about the flower-garden which betrays weakness, or impresses the mind with a conviction hat the objects seen around are in a situation unsuited to their constitution, and, consequently, hat they are unnatural to the locality. Everything, as far as practicable, should wear an aspect f propriety and ease ; for an idea of constraint comports ill with the feelings and associations that n otherwise well-arranged and neatly-kept pleasure-ground tends to draw forth.

But it must not be supposed that we intend by these observations to object to houses for earing and displaying plants wholly unfitted for open air culture. Here we are obliged to cknowledge the insufficient command of art over nature. It is only where delicate and tender lants are used to supply the place of some of the hardier and less beautiful, that we enjoin bedience to the foregoing direction. A conservative wall is an object of interest, if so managed hat the plants appear rather to be placed there to cover an unsightly object, than the wall built s a protection for a tender plant.

Now is a proper time to trim and train the growing shoots of plants that require to be placed gainst a conservative wall, and especially such as evince a disposition to grow long and weak. This will materially promote their early maturity, and endue them with a greater power of esistance against the severity of the succeeding winter. It will also greatly improve the appearnce of the plants and the probability of profuse bloom. But it must not be carried to too great n extent. Shrubby plants that flower on short twiggy shoots, and do not ramble too far from he wall, should be allowed to grow in their natural position, and will only require to be occasionlly thinned and regulated when too much crowded, to permit all to be fully exposed to light nd air.

Much of the beauty of a lawn, and thereby of the whole garden, where this is a reigning eature, depends on the frequent application of the scythe. When grass is allowed to grow long, t is almost impossible to cut it without leaving the marks of the scythe, and this ought always o be avoided as much as possible ; and, moreover, the lawn is deprived of that lively and efreshing green when the grass is cut, which forms one of its chief recommendations. Daisies, nd other flowers, too, appear, and detract from the interest that a lawn properly attended to is apable of producing.

Verbenas, Petunias, and all the host of half-hardy border plants, though now turned out into heir quarters for the summer, are not to be left to themselves. They will still require tendance o induce them to cover their allotted surface in good season. Strong rampant growth should be inched back, in order that lateral branches may be formed, to produce a closely compact and erdant cover, instead of a few rambling, straggling shoots. *Salvia patens* and *S. fulgens,* and ther upright-growing species, *Pentstemon gentianoides* and all its varieties, the different species f *Phlox* and *Lychnis*, as well as many other plants of similar character, should have their ranches spread out and fastened to the ground with small hooked pegs. By this means they nay be made to cover a greater surface ; the horizontal position of the shoots will encourage the rowth of laterals, and the use of stakes will be avoided ; and, at the same time, the dwarf, close, nd even character, will be a striking improvement on the beauty of the bed.

A little present bloom should ever be sacrificed, when likely to be repaid with interest at a later season. Therefore, whenever a precocious attempt to flower is exhibited, the inflorescence should be removed at once. Growth must be the first object; and until the shoots have extended over the whole border, and become one mass, no blossom should be permitted to expand. Too much eagerness and impatience for flowers is frequently manifested, and almost as frequently defeats its purpose.

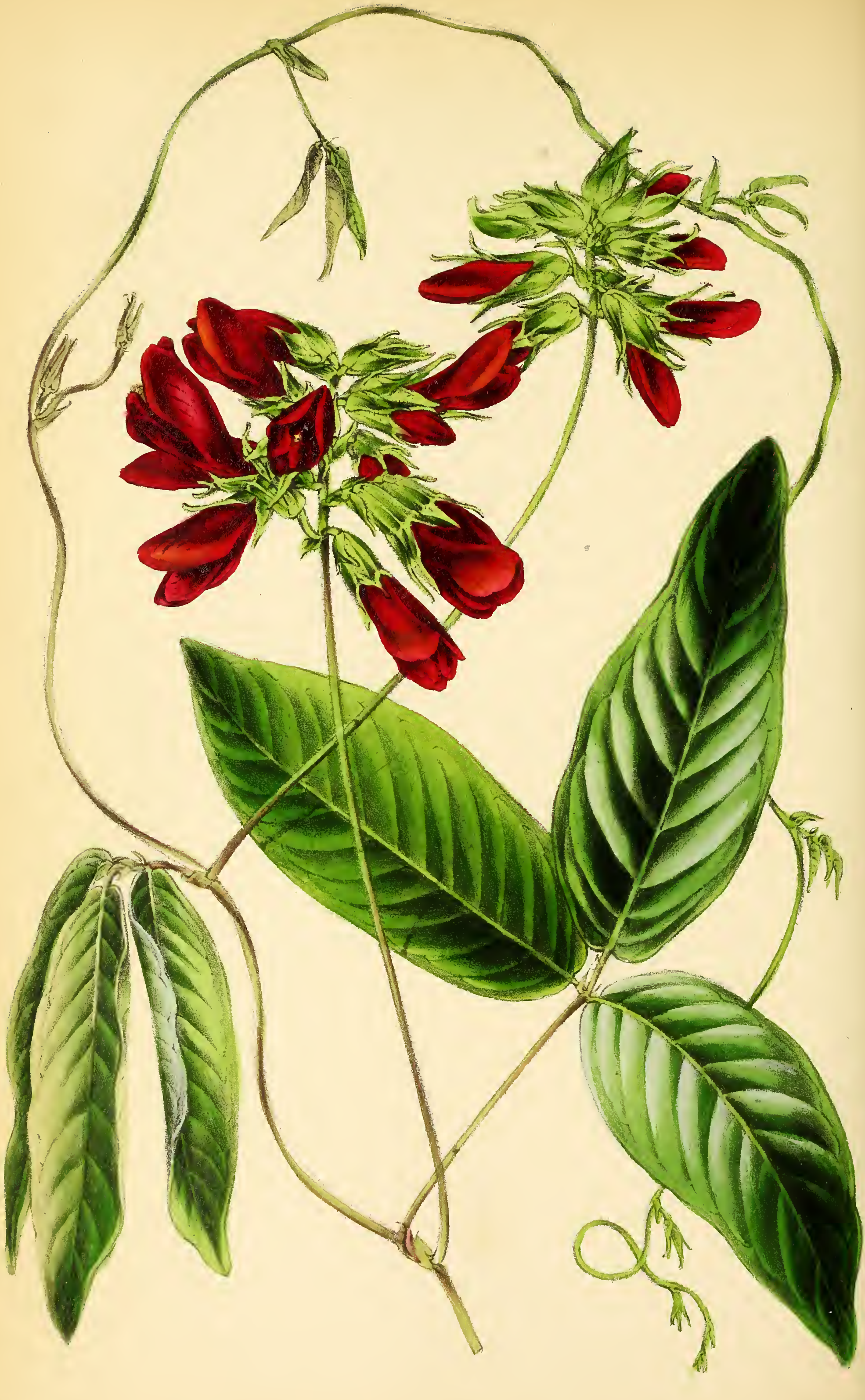
Anemones, Hyacinths, Scillas, and other plants which have ceased to flower, should be removed from the parterre ; and annuals in a forward state, provided for the purpose, may be planted out to supply their place. More annuals may be sown, and preserved in pots to occupy the place of other things, as their flowering season successively passes away.

A portion of the blossom-buds of *Rhododendrons* and *Azaleas*, and other hard-wooded plants, maybe abstracted where they are excessively abundant, and a fine bloom is desired. It will not only be a means of securing larger blossoms, but the plants will also be less weakened and exhausted, and more able to produce a vigorous bloom another season. As soon as the flowers have faded and fallen away, the swelling capsules should be removed, in order that the whole forces of the plant may be concentrated in the production of new shoots. Much of the yellow sickly appearance of these plants may be attributed to permitting them to expand too many blossoms, and afterwards to perfect a quantity of seed that, after all, is not wanted.

In the stove, fires may be discontinued, except in wet and damp weather, or in cold evenings. It is a great mistake to imagine that a high temperature is beneficial to plants during the night. On the contrary, it is extremely injurious, causing the shoots to be elongated without being strengthened in proportion ; there is, consequently, a double economy in allowing the temperature to fall some degrees below that maintained in the day-time. *Achimenes*, *Gesneras*, and *Gloxinias* must be encouraged by continuing them in a slight bottom-heat in a close pit, shaded from bright sunshine, till the flowers begin to develop. Cacti, on the contrary, should have a very exposed situation, so that nothing may intervene between them and the immediate rays of the sun, for they require all the light that it is possible to command. The more common species, such as *Cereus Jenkinsonii*, and *speciosissimus*, *Epiphýllum spléndidum* and *speciòsum*, may be removed to the open air and placed on dry ground in an airy situation, and covered with prepared calico or canvass during heavy rain ; or if convenient, a few may be sheltered in a vacant pit, admitting all the air possible during the day.

Greenhouses and Conservatories require little beyond the usual routine of watering, giving air, pinching back, and tying up the new growths. The inroads of insects must be stopped in the commencement, for if they are once allowed to acquire an ascendancy they will be difficult to exterminate.

Chrysanthemums must never be stinted in their growth for want of sufficient pot-room. They will also require to be liberally supplied with water. And, indeed, a sufficiency of water is of the utmost consequence to other plants as well as *Chrysanthemums*, and especially if the weather prove excessively dry and warm, as is frequently the case in this and the two succeeding months.



Clitoria fulgens.

CLITORIA FULGENS.

(Bright-flowered Clitoria.)

Class.
DIADELPHIA.

Order.
DECANDRIA.

Natural Order.
LEGUMINÒSÆ.

Generic Character.—*Calyx* furnished with two rge bracts at the base, five-cleft. *Vexillum* large. *tamens* diadelphous, inserted along with the petals, bove the base of the calyx. *Style* rather dilated at the pex. *Legume* linear, compressed, straight, two-valved, uminated by the base of the style, one-celled, many-eded. *Seeds* usually separated by cellular substance, xillary, pedicillate.

Section — Centrosema. *Calyx* campanulate, cleft ito five beyond the middle. *Vexillum* furnished with a spur behind. *Bracteoles* striated lengthwise. *Leaves* pinnately trifoliate, having one pair of leaves and an odd one.

Specific Character.—*Plant* a twining evergreen sub-shrub. *Stem* round, clothed with numerous short depressed hairs. *Leaflets* ovate, pilose, with a fringed margin. *Inflorescence* racemose, on a stalk six inches long. *Vexillum* scarcely expanding.

Synonyme.—*Centrosema coccinea.*—*Hort.*

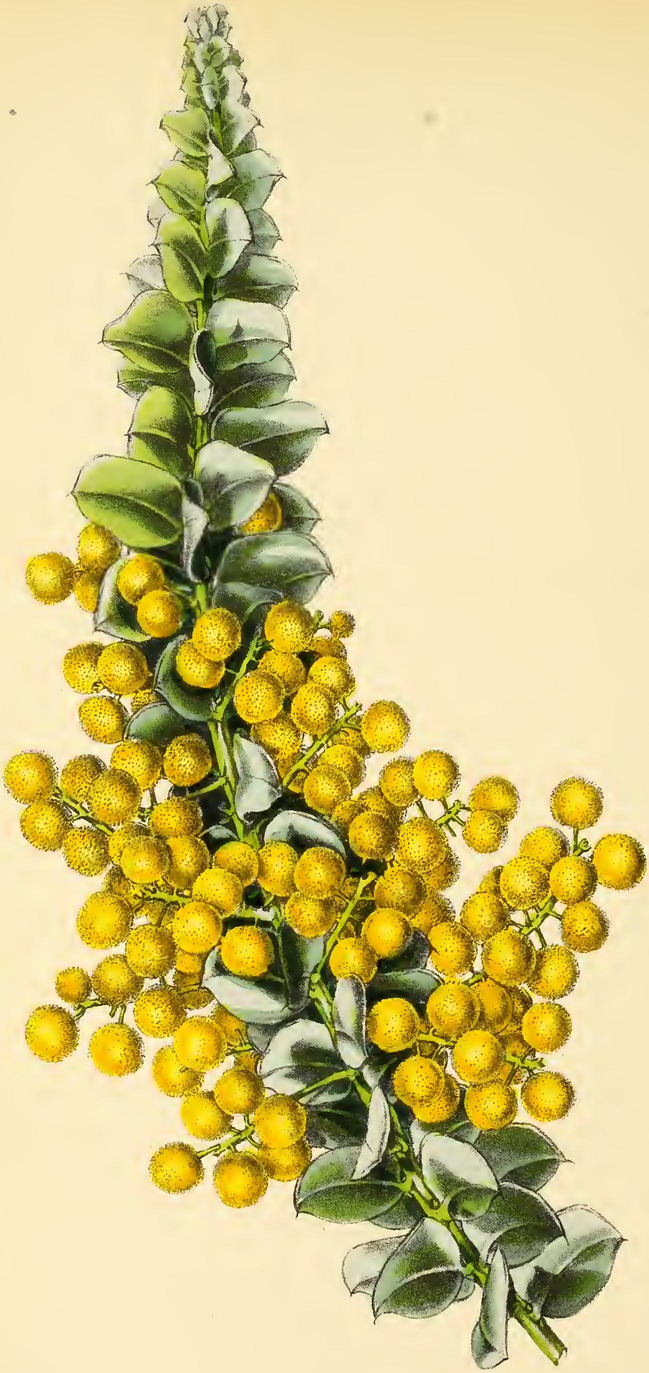
The most fascinating feature of all houses devoted to the display of flowers is, n our mind, those elegant plants usually called creepers. Gently supported by he aid of pillars or of trellises, and hanging loosely about them, or depending in raceful festoons from the roof, they lend an air of ease and finish that contributes ot a little to enhance the beauty of the general aspect, by divesting it of stiffness nd formality.

The present species is an elegant addition to the number of these plants, and as obtained by Messrs. Veitch and Sons, of Exeter, who exhibited a specimen at he Horticultural fête at the Chiswick Gardens in May, as a species of *Centrosema*, ne of the division of the genus *Clitoria*. It was discovered by their collector, r. William Lobb, growing on rocks,—over which the graceful slender branches pread in all the wild luxuriance of nature,—on the Organ Mountains of Brazil, n the autumn of 1840; and seeds were received from him, at the Exeter Nursery, n the spring of 1841. These were sown immediately, and produced plants which owered for the first time, though rather scantily, last autumn. The abundance, owever, in which the blossom buds have been developed during the present spring, stify us in considering it most likely to prove a very free-blooming plant.

The long, slender, and slightly hairy stems, are well adorned with handsome liage, having a smooth and bright green upper surface, and the lower side of a paler hue, closely covered with numerous very short soft hairs. The slightly depressed position of the leaves has a pretty appearance, especially when the stems are trained spirally round a basket, as they then fall over each other in a neat and loosely tiled manner. From the axils of the leaves, the flowers are produced in a clustered head, supported on a stiff and wiry peduncle five or six inches long, elevating them sufficiently above the foliage to display, without interruption, the bright and glowing scarlet blossoms. Such is the vivid brightness of the flower, that our artist has been unable to match its richness, and the figure must, consequently, be regarded as much deficient in colour.

It has, hitherto, been cultivated in a house intermediate betwixt the stove and greenhouse, but it may probably be found to succeed pretty well in the ordinary temperature of the greenhouse. It thrives well in a mixture of peat, loam, and sand, and when removed from a small pot to a large one, its natural situation amongst rocks would point out the propriety of intermingling with this compost a few pieces of porous broken pot or charcoal, to keep the soil open, and facilitate drainage. And, although it will need a reasonable abundance of water during the season of growth, it will be proper to limit the supply in winter, as moisture is then liable to injure it, especially with a low temperature.

Seeds have not yet been produced in this country, but it strikes root with tolerable freedom, from cuttings. The entire stock is yet in the hands of Messrs. Veitch.



J. Harley del. & lith.

ACÀCIA CULTRIFÓRMIS.

(Coulter-shaped-leaved Acacia.)

Class.
POLYGAMIA.

Order.
MONŒCIA.

Natural Order.
LEGUMINÒSÆ.

GENERIC CHARACTER.—*Calyx* four or five-toothed. *etals* four or five, sometimes free, and sometimes ined together into a four or five-cleft corolla. *Staens* variable in number, from 10 to 200 in each flower. *egume* continuous, dry, two-valved.—*Don's Gard. and otany.*

SPECIFIC CHARACTER.—*Branches* smooth, angular; *phyllodia* cultriform, ending in an acute hooked mucrone, which leans to one side, and furnished with a gland on the middle of the upper margin, one-nerved, the nerve nearly parallel with the lower margin; *heads* crowded; disposed in racemes.

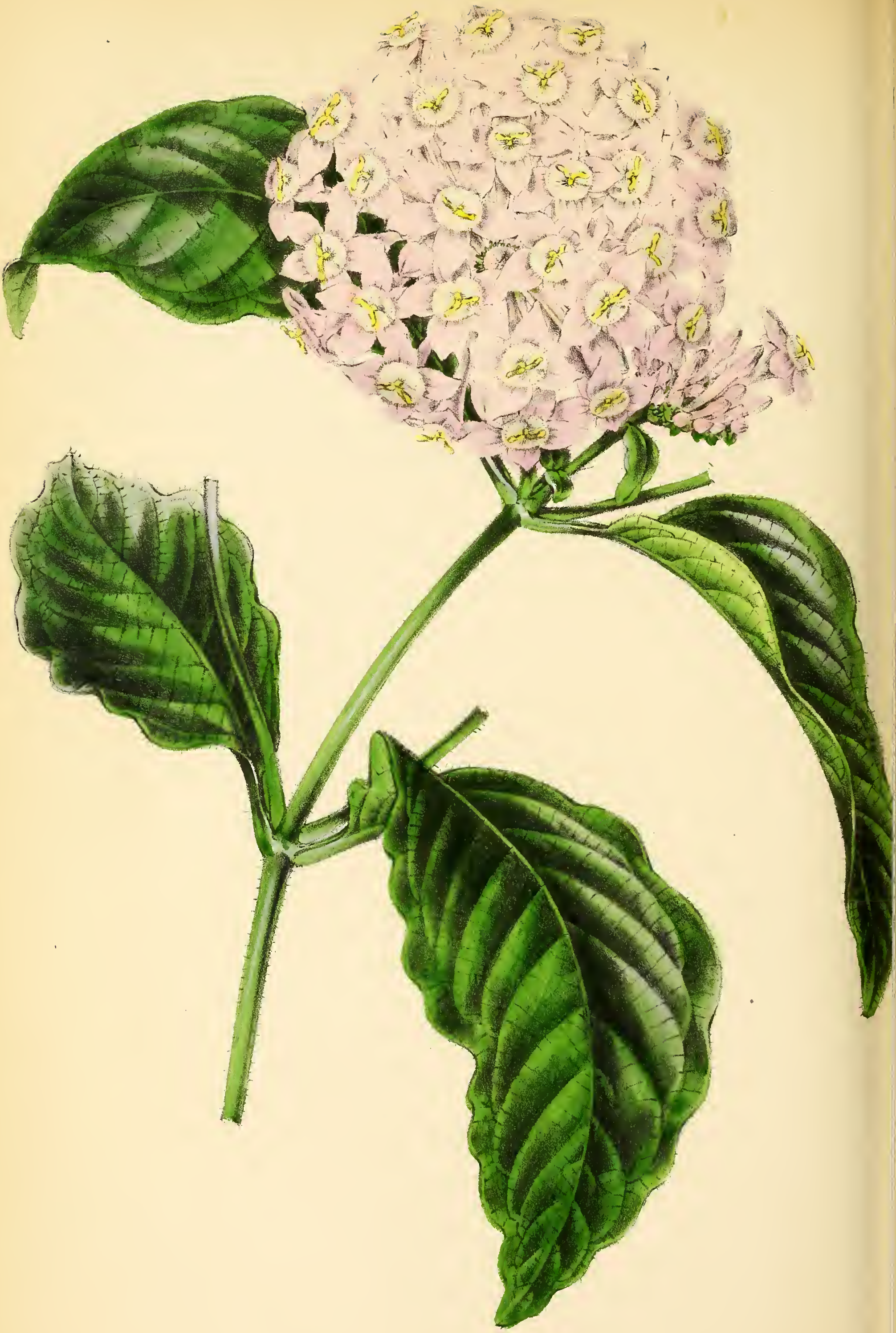
FEW families of plants are more extensive than the genus *Acacia*, or abound ore with really handsome and ornamental species. Among so great a number e are naturally led to look for considerable difference in the qualities that render hem valuable in the eyes of the culturist, and also in some individuals so near an pproximation to each other in general lineaments and habits, as to render the iscovery and definition of any tangible distinction extremely difficult.

The casual observer would scarcely notice any material dissimilarity between . *cultriformis* and many other nearly allied species, which present an air and abit in many respects strikingly uniform, but are yet marked with peculiar and ery characteristic distinctions, though less obvious and glaring. *A. dolabriformis* nd *A. scapuliformis* are both very similar to it. The latter may be known by the aves being a little longer, and having a rather more robust habit, the whole plant lso being more profusely covered with a silvery glaucous bloom. *A. dolabriformis* s still less glaucous, and there is also a difference in the inflorescence, whilst the aves or phyllodia are less rigid, and are destitute of the small gland near the iddle, which is common to both the other two.

In the earlier months of the year there are few plants more engaging, or more seful in the decoration of the greenhouse, than the different species of *Acacia*, den with an almost over-abounding number of their unassuming and modestoking globular heads of golden flowers. The light, airy, and elegant, appearance f the slender branches and small phyllodia, form, even when not enlivened with bloom, an agreeable variation placed in the greenhouse amongst shrubs of stouter growth, and leaves of more ample dimensions. Kept in a dwarf state by repeated pruning and shortening back the young shoots, *A. cultriformis* forms an excellent plant to place in the drawing-room during the flowering season ; or it may be planted in the border of a conservatory with great propriety, and if allowed to grow in its natural way, will speedily form a large tree. Even in a pot it will attain the height of fifteen or twenty feet in a few years, if not kept down by pruning.

Acacias will succeed tolerably well in almost any good garden mould, but that which appears most suitable to them, is composed of about two-thirds sandy loam, and the remainder a fibrous open peat earth. They require a liberal supply of water during the time they are flowering, and whilst forming their young shoots. They may be propagated by cuttings inserted in sand, and treated in the usual way.

Our figure was prepared from a large and well-grown specimen, which flowered last April, in one of the greenhouses at Messrs. Rollisson's nursery, Tooting. It has been in their collection about fifteen years, and was originally obtained from New Holland.



S. Holden del & Lith

Pentas carnea

PÉNTAS CARNEA.

(Flesh-coloured Pentas.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
RUBIÀCEÆ.

Generic Character.—*Calyx* tube short, turbinate; imb deeply five-cleft; segments narrow, unequal, ometimes with one or two small glands at the recesses. *Corolla* tube lengthened: throat campanulate, bearded nwardly; limb spreading, five-cleft; segments ovate, mooth, imbricated in æstivation. *Stamens* five, inserted below the throat. *Filaments* short. *Anthers* inear. *Disk* epigynous, thick. *Style* thread-shaped; apex two-lobed. *Capsule* nearly globular; apex free, sharp-pointed; cells two-valved; valves two-cleft. *Seeds* numerous.—*Benth.*

Specific Character.—*Leaves* ovate or oblong oval, acute, wedge-shaped at the base, hairy. *Corolla* tube many times longer than the calyx. *Style* branching, lengthened. *Capsule* valves parted.

The beautiful half-shrubby plant here depicted has been lately introduced to this country from the Continent, and grown in several of the gardens and nurseries about London under the name of *Sipanea carnea.* It was first received at the Botanic Gardens of Kew, from Mr. Mackoy of Liège, and has since been obtained by Messrs. Rollisson and others, from the Jardin des Plantes at Paris. No nemoranda were furnished with these plants respecting the native country of the pecies, and we are, consequently, unable to state with certainty what part of the world claims it as its production. Another species of the genus, *P. parviflòra*, having been discovered by Dr. Vogel, in the late Niger expedition, growing in the western part of Tropical Africa, near Accra, and other plants nearly allied being ound in the same neighbourhood, Sir William Hooker, in the Botanical Magazine, onjectures this to belong to the same locality.

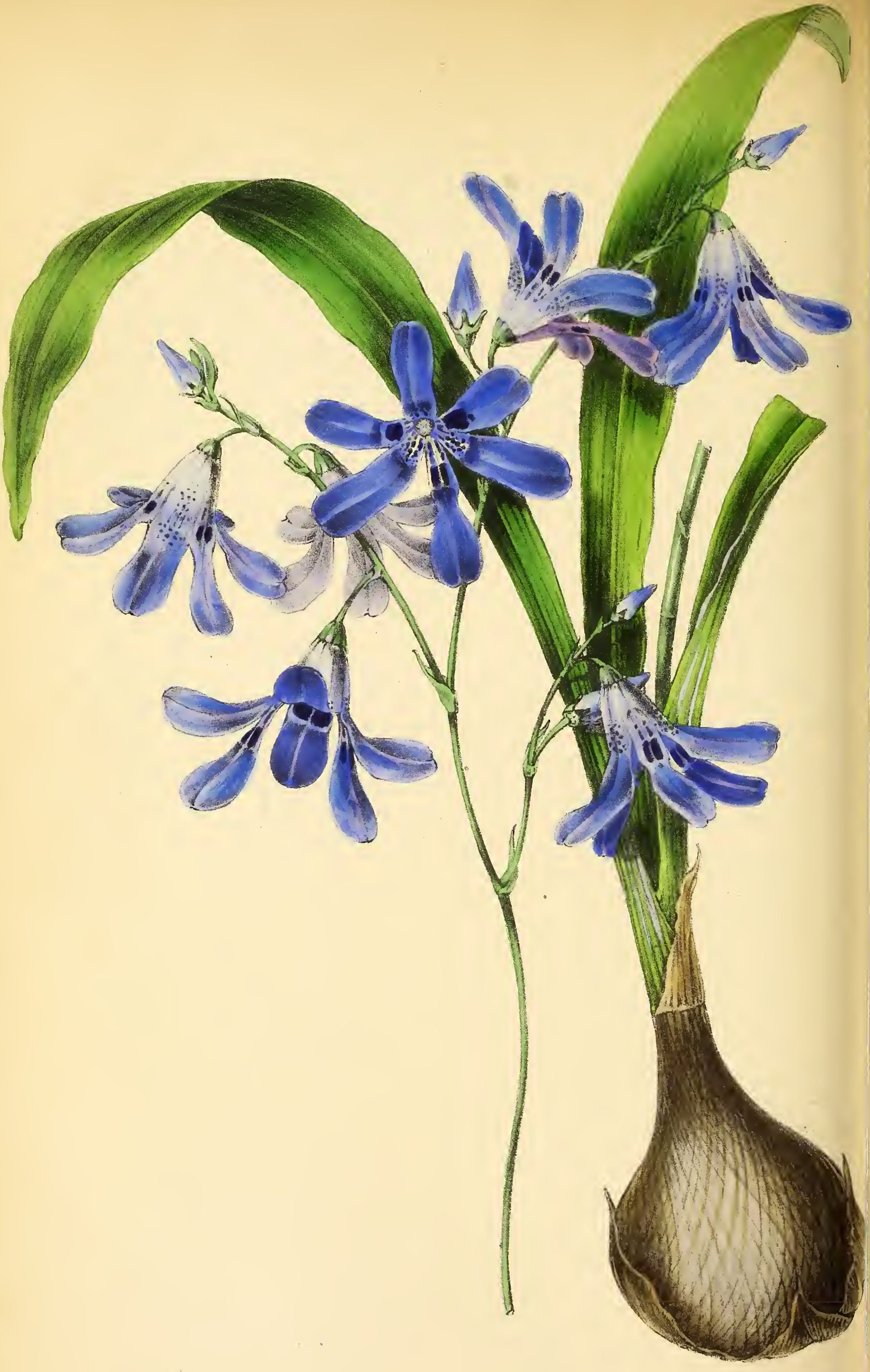
As an ornamental plant for the stove, or possibly for a warm greenhouse, this will be hailed as an acquisition of some importance. It has an excellent robust habit, and produces a number of partially-spreading branches, forming a handsome bushy plant, clothed with an abundance of large, broad foliage, concealing the tems to the very base with its lively verdure. These branches usually bear owers as they are formed, even when the plant is in an exceedingly dwarf state, without appearing to have any injurious effect on the continuing growth of the pecimen. The blossoms are collected into corymbose clusters and stand erect, isplaying their lovely soft flesh-coloured hue to the utmost advantage. When the flowers are first developed they are very pale, but gradually acquire colour with exposure. If the plant is kept growing in a favourable situation, it will continue to blossom, with the formation of new branches, for the greater part of the year; and such is the rapidity of its growth, that it will form a large bush in the course of a single season.

Like most soft-wooded plants of quick growth, it requires a rather large pot, and a strong soil, rich in nourishing properties. And it will probably be beneficial to use an occasional application of manure water, to increase its vigour, especially where large specimens are desirable. In the summer months there is little doubt that it will be found to succeed satisfactorily in a close greenhouse, although in winter and spring a little more warmth is necessary.

It is easily propagated by taking off the extremities of the young shoots as soon as they have acquired a little firmness; and, inserting them in a pot of sand, covered with a bell-glass, and placed in heat, they will take root in ten days or a fortnight, and should be immediately potted into separate pots and encouraged to grow.

The generic name, *Pentas*, has been applied by Mr. Bentham, from the division of the corolla being quinary instead of four-cleft, as in other allied genera. Although general, this is not constant, as flowers on the same head are four and five-parted. Three or four plants, which have hitherto been arranged under other genera, are suspected by Mr. Bentham to belong rightly to this.

Our drawing was made last April at the nursery of Messrs. Rollisson.



S Holden del & Litho.

Cummingia trimaculata.

CUMMÍNGIA TRIMACULATA.

(Three-spotted Cummingia.)

Class.
HEXANDRIA.

Order.
MONOGYNIA.

Natural Order.
LILIACEÆ.

Generic Character.—*Perianth* half-superior, campanulate, six-cleft, deciduous. *Anthers* emarginate at he base; *filaments* very short, wide at the insertion, conniving. *Ovary* three-celled. *Ovules* indefinite. *Stigma* covered with frosted points. *Capsule* three-celled, dehiscing through the back of the cells; *cells* ew-seeded.—*Don's Gard. and Botany.*

Specific Character.—*Plant* a bulbous perennial. *Stem* erect, rigid. *Leaves* linear, channelled, glabrous, recurved, spreading. *Flowers* in loose panicles. *Pedicels* thread-shaped, very smooth. *Perianth* monopetalous, ten-nerved; *limb* spreading, longer than the tube, three-spotted. *Filaments* obcuneate. *Anthers* yellow. *Style* awl-shaped, white.

The eagerness so universally manifested to possess blue-flowering plants will create for the present little species, when brought more generally into cultivation, and its qualifications as a becoming and ornamental plant more widely known, a greater degree of solicitude than has hitherto been extended towards it. The apathy and indifference with which but too many of the most lovely of Flora's kingdom are regarded, when the first feelings which their novelty excited have subided, is a matter continually exhibited, and our greenhouses and flower-gardens are thus prevented from being the gaily decorated places they might be with a udicious selection of the plants already in the country. Indeed, the introduction of new species, is in some degree at least, an evil, when mere novelty can usurp the place of positive merit, and really deserving and engaging plants are disregarded with the sole view of making room for a new candidate of inferior pretensions.

The subject of our embellishment is a Chilian species, and was first known in his country through plants collected by the daughter of the British Consul at Valparaiso, and forwarded to a friend in England, who presented them to the Chelsea Botanic Garden in 1829. The specimen from which our figure was taken in the month of June 1842, at Mr. Knight's nursery, was received by that gentleman in 1840, from a friend at Valparaiso, where it is known amongst the natives by the name of *Paxero*, or *Paterita*.

The flower-stalk grows about a foot high, and is crowned with a loose and preading panicle of pretty, pendulous, bell-shaped blossoms, attached to short and attenuated, flexile pedicels. The leaves are long and narrow, and surround the flower-stalk without rising high enough to interfere with the exposure of the flowers; but instead, they are spread out with a pleasing gentle curvature.

It flowers in May and June, and when grown in a pot is a neat plant to place on the front stage of a greenhouse. To have fine flowering specimens for the open borders, the bulbs should be potted early in a light sandy loam, and started into growth in a frame, to be planted out, as soon as it can be safely done, without injury from frost, in a warm border prepared with a similar soil. But the bulbs may be allowed to remain in the ground all winter, as they merely require to have the ground covered with some protecting material to preserve them uninjured from severe frosts.

Cummingia is a genus formerly incorporated with *Conanthera*, but separated by Mr. D. Don, and named in compliment to Lady Gordon Cumming. The specific name of the present species is expressive of the large dark spot at the base of each of the three petals.

GARDENING AS A SCIENCE.

VEGETABLE PHYSIOLOGY.—No. VI.

Having proceeded so far into an inquiry concerning the structure of plants, it will be now proper to consider the *functions* which may be assigned to each several part of the organization.

1. Functions of the Root.—As the root is the part by which most plants are attached to the soil, it has been supposed, and with reason, that it imbibes the nutritive fluids of the ground, and conveys them to vessels, which transmit them to trunk, stem, branches and leaves. But all plants are not attached to soil; some float in water, others derive their entire nutriment from the air. But apart from such anomalies, we can presume that all vegetables which grow and flourish in the ground, must abstract from it some matters essential to their existence; and this fact is proved to be such, by the certain and almost immediate effects which are observed when water is given to a potted plant, drooping in a dry and thirsty soil. *Water* then is necessary—a pabulum of life,—but is it taken up, *pure*, as such, or does it combine with other elements, extricated within the earth, and united to it by its solvent power?

Water, by analysis, is converted into hydrogen and oxygen gases, and these, in their turn, can be so made to combine, as to re-form fluid water; but water alone can never produce *carbon*,—that is, the base of woody tissue; and yet all plants abound with carbon.

Physiological botanists instruct us, that carbon, however minute its particles, cannot be taken up by the root: Davy even found, that of the charcoal washed from gun-powder, not an individual particle could be traced in a vegetable grown for a considerable time in water mixed with the carbon, in a state so impalpable: therefore it is argued, that as carbon forms the bulk of vegetable matter, it can only be introduced when in the condition of *carbonic acid* dissolved in the water of the soil.

Such carbonized water can be easily prepared in an apparatus containing powdered chalk, or marble dust, mixed with a quantity of water, and rendered effervescent by pouring on it small portions of muriatic or sulphuric acid.

The gas thus generated (*carbonic acid*) being made to pass through a volume of pure water, will combine with that fluid to a considerable extent, and impart to it a slightly pungent, and rather acid flavour.

Plants could absorb carbonic acid so dissolved in or blended with water; but what proof do we possess that such a process is ever carried on in the vicinity of roots? Let those answer the question who are possessed of demonstrative proof.

The Sap—that is, the raw fluid absorbed directly from the earth by the soft, spongy tissue of the rootlets—can by no means hitherto known, be proved to contain any of the specific qualities or products of the perfect plant. Water, and water only can be safely affirmed to pass into the roots; and yet as manures become decomposed within the soil, it is reasonable to conclude that the elements of water, combined with some hydro-carbon, enter, and thus furnish the plant with certain portions of its constituent elements. Again, we may reason thus—a plant deprived of its roots must inevitably perish, and if it be not properly supplied with some appropriate manure, although it may continue to exist, it ceases to flourish, its foliage and green parts become degraded, and a premature bloom is frequently produced; it therefore obtains carbon in one form or other.

The *Sap of a Vine* prior to the development of its full foliage can be collected at two periods of the day. In taste it is nearly insipid, yet while drying upon the wounded shoot, it deposits a considerable quantity of salt of lime. Prout has given a complicated statement of its components; but we prefer to abide by what we have witnessed; and as it appeared that by the addition of oxalate of ammonia, a milkiness, followed by a sediment, was produced, we obtain further evidence that vine-sap contains lime in solution. As therefore *lime* is an inorganic product, is often present in soil, but never in the air, it must be inferred that, in common with other inorganic constituents, it is introduced with the aqueous sap derived from the earth.

The conduits of the crude sap were supposed to be tubes, and in some of the tubes (*longitudinal vessels*) of purely herbaceous subjects, or very young wood. fluid can be traced; but the cellular tissue is always replete with juices, and therefore it should appear that Mr. Knight was perfectly correct in his opinion, that it is through the medium of the *cells* that the sap ascends. It had been observed that the *fibres* were very numerous and strong, that they ran longitudinally, and with great uniformity, together. But in these woody fibres no trace of perforation anything resembling tubular structure could be discovered. However, it was necessary to believe that sap-vessels must exist somewhere, and certain writers overlooking the system of juicy cells which surround and clothe the woody and threadlike fibres, advocated hypotheses all differing from each other, but none approaching in luminous simplicity to the *cellular* theory of Mr. Knight.

The *fibrous*, or, as some call it, the tubular system, appears then to be the representative of bone in the animal economy; for, by degrees the fibres consolidate, and become wood in trees, and substance equivalent to wood in the softer and herbaceous tribes; they are the framework of vegetable structure, and not the permanent vehicles of fluid nutriment. But what shall be said of those interesting pieces of refined mechanism, the *spirals?*

These have been defined by some as accessories to the sap-vessels. Others view them as air-tubes, on the ground "that there appears to be no provision for the conveyance of air through the central parts of plants, if that office be not performed by the spiral vessels."

Many years since we suggested *that the spiral system might act as the organ o elasticity;* and nothing has occurred or been written which has, in any degree thrown doubt upon the opinion we then formed from observing that the *elasticity* of the spirals was prodigious—that they exist in one form or other in most plants—and that the peculiarity of their structure, which resembles the coiled spring of a bell-wire, argues that they have other functions allotted to them than that of merely conducting the sap. These and other properties, we stated, adding that the "pliancy of trees, the readiness with which they yield to the force of winds, and the facility and springiness with which they recover their upright position, are facts strongly favouring the idea that they contain *internal springs*, which, like a coil of wire, are capable to receive and support motion in every direction, without offering impediment or receiving injury."

If these positions can be demonstrably controverted, the impugning facts ought to be stated; if not, they may be considered as forming a part of the theory of vegetable function.

As a further and general illustration, we observe that every member of the plant, including leaves, stipules, and bracts, comprises cellular tissue, abounding with fluid matter; that a system of fibres passes amidst these cells, traceable in the footstalks and veins of the leaf, &c. These fibres are manifestly the organs of support, which connect every member with the part where they ramify, and to which they are attached; they also impart and sustain flexibility and motion. The cells, on the contrary, are the vehicles of fluids that pass and repass interchangeably through the medium of that fine membrane which constitutes their walls (*parietes*). Can we then err, physiologically or chemically, in thus endeavouring to assign peculiar, specific functions to organs so differently constructed?

Medullary, or *Convergent processes.*—In *texture* these *rays* are cellular; in this all are agreed. Keith says that they are soluble in fluid, therein differing from the ligneous or fibrous layers. In exogenous trees the convergent rays are traceable from a very early period, but in herbaceous plants they are rarely seen till the plants produce seed. Du Hamel conceived that they originated in the pith, radiating as they advanced towards the bark, and hence were called *divergent rays;* but Knight, while tracing the results of budding, observed that "the wood formed under the bark of the inserted bud unites, indeed, confusedly with the stock, though still possessing the character and properties of the wood from which it was taken, and exhibiting *layers of new formation* which originate evidently in *the bark*, and terminate at the line of union between the graft and stock."

Again, Knight observed that if a portion of a stem be stripped of bark, so as to leave the surface of a small portion of the sap-wood (alburnum) uncovered, the wound will heal, "first by means of the production of new bark issuing from the edges, and gradually narrowing the extent of the wound; and then by the production of new layers of *wood*, formed under the bark as before. The new wood will not indeed unite with the portion of alburnum that had been exposed to the air; but it will exhibit, on an horizontal section, the same traces of divergent layers as before, extending from the bark in which they originate to the lifeless surface of the old wood within. It is evident, therefore, that the divergent layers are formed, not from the pith, but from the proper juice descending through the channel of the bark."

So Keith expresses himself, when commenting on Knight's experiments, which led that profound physiologist to substitute the term convergent, for divergent.

In further proof of the theory, it should be borne in mind that the innermost layers of a tree—the true heart-wood—retain some moisture, though the current of the annual sap is confined chiefly to the last formed, outward layer, or sapwood (*alburnum*). The entire body of wood partakes also of a certain portion of the specific resinous, oleaginous, aromatic qualities of the bark, although the ascending sap has always been nearly void of flavour.

From analogy of facts it then may be inferred that the *medullary processes*, now called convergent layers, are the media through which the connexion between the old wood and the newly deposited layers of alburnum and liber is maintained and that these layers supply the tree by a lateral course, with resinous matters which preserve the wood from decay and give it hardness and durability.

We shall have occasion to throw more light upon this mysterious function o supply, when viewing the offices of leaves, and the laboration of the food, and specific fluids of plants.

THE WISTARIA SINENSIS.

Every one who has been to either of the May exhibitions of the Horticultura Gardens, at Chiswick, within the last few years, has doubtless been filled with admiration by the magnificent specimen of *Wistaria sinensis* on one of the walls which is generally at that time in full flower. And we presume that few wh have seen it in such an aspect, have gone away without a desire to possess s beautiful an ornament.

Judging from the comparative infrequency of its occurrence in small gardens, i would appear not to be known that it propagates so readily as to be purchaseabl in any nursery for a small sum, and that it may be cultivated with the greates ease, as well as in a considerable variety of ways. In stating these plain facts therefore, and referring to the plant itself as an evidence of its desirableness, w shall just glance at the several modes in which it may be advantageously treated.

As a greenhouse or conservatory climber, its attractions are sufficiently familia and recognised, although, considering its extreme beauty and fragrance, and capa city of blooming several times in one season, besides flourishing in almost an aspect, and being by no means particular as to where it is planted, we shoul expect to find it in every greenhouse and conservatory throughout the country.

In the character of a tall shrub, however, or of a pole plant, for placing in the beds or borders of conservatories, or as a covering to any of the pillars which support the roof, or even pruned into a state of dwarfness, and kept in a pot, or made to trail over rock or rustic work in the centre or at the back of a greenhouse, t is almost entirely unknown.

To adapt it for any of these forms or positions, hardly any treatment is requisite, beyond attention to pruning. But it is indispensable that this pruning be exceedingly rigid, and be followed up with the greatest strictness.

The ordinary habit of the plant being to produce very long and comparatively weak shoots, it of course commences to form these from the earliest period of its growth. Indeed, as soon as a layered branch has become a plant by throwing out roots from that part which is plunged in the ground, and which has been partially cut through to facilitate the process, it will begin to develop those tenuous branches which are peculiar to the species; and, where a bushy specimen is required, the pruning must then immediately be started.

Nor will it be at all prudent to cease this close pruning until the plant has been reared into the desired form, when it will also have acquired that tendency to bear short blooming spurs, instead of big branches, which will render the subsequent prunings light and trifling.

By this kind of routine, therefore,—taking care to keep the shoots cut back very closely every year at least, and, in the first stages, twice or thrice each season,—good shrubby or pillar plants may readily be obtained for the conservatory. And we conceive that both the novelty and beauty of such objects would contribute powerfully to the adornment of plant structures.

Still, independently of the suitableness of this *Wistaria* for attaching to the pillars of a conservatory, and for being so confined by pruning as to cover them alone, without extending over any other portion of the building, it possesses an equally striking adaptation for affixing to poles, whether of wood or iron.

And here we cannot but digress a little to express our wonder that, in addition to those fine climbers which are now, in well kept establishments, made to depend so naturally from the roof of the house instead of being retained in that trim, restricted form which was once so universal, the interesting open-ground practice of training climbers to poles is not freely introduced. A pillar of exotic climbing Roses, for example, supported by a pole, and standing out amidst the varied shrubs or arboreous plants of the conservatory, would be a most delightful object; and there is scarcely a climber of any description that might not be similarly managed; for, when once they have been brought, by pruning, into a duly compact form, with a strong tendency to produce nothing but lateral shoots, these last will, if left almost untouched, soon fling themselves out around the stem in every direction, and gradually take that drooping and waving character which causes them to be so exceedingly graceful.

The *Wistaria sinensis* is an excellent plant for this purpose, as the experience which has been had of it in the open ground fully proves. By efficient pruning it will acquire, when at the height of ten or twelve feet, such a number of latera branches about a foot long, that, after it has reached this state, it will bear nothing but blooming spurs; or, if it occasionally send out a few of its long slender shoots, these will only serve to increase its beauty during the summer, and may be easily pruned away in winter.

Treated as a dwarf shrub, and cultivated in a pot, it is, moreover, an extremely managable plant, and makes a very agreeable thing for a show-house, as well o account of its actual interest, as because the fragrance of its blossoms can thus be better enjoyed. What can be accomplished with it in this manner is yet, to many a pure speculation; but the specimens which have here and there appeared a public exhibitions show that the most satisfactory results have been obtained. A in the cases before spoken of, pruning is the means by which it can be brough into this dwarf condition, and since it grows in the commonest soil, the compos supplied to it in a pot should be of the simplest nature, such as ordinary garde earth, while the pot itself should not be too capacious.

In alluding to the *Wistaria* as a pot plant, we would not, however, pass by it capabilities for forcing, under such circumstances. Most cultivators have seen ho nicely this plant develops itself under the stimulus of a slight heat, when traine over the roof of a Camellia-house or warm conservatory, where a little artificia warmth is used. Fully as free would, therefore, most likely be its development as a forced plant in a pot. And when its attractions for such an object ar considered, it will, we think, ere long be frequently subjected to the experiment.

We have long looked upon this species as likely to prove one of the mos valuable accessions to our present rather limited stock of forcing plants, and w should rejoice if any hint of ours brought it more under notice in this respect Its recommendations are freedom in the production of flowers, great showines and an exquisite fragrance. It is also a plant which would, doubtless, soo become so habituated to forcing, that the same specimens would answer year afte year, and even become improvingly fit for the process.

Another end to which it might be applied in greenhouses or conservatorie is, trailing over rockeries or rustic work. To give it its due effect in these position the shoots should occasionally be plunged under one or more of the stones, or othe material, and issue again in the next patch of soil as a fresh plant. Such a proceeding, beyond securing the plant more firmly, and hiding the naked portion its branches, and harmonizing its general aspect more thoroughly with the characte of the rockery, and helping to throw out the bolder forms and outlines of the latte would further conduce to the shrubbiness and fertility of the specimen. And as n rain occurs in a plant-house, as it does in the open air, to dash up the earth aroun its beautiful flowers and mar their appearance, the fact of their lying, in som instances, so near to the earth, would be in no degree objectionable.

To precisely the same purposes which we have noted in connexion wit lant-houses, is the *Wistaria* applicable in the open ground, if we except forcing, nd consider it as a low shrub, instead of a shrub in a pot.

When grown as a wall-plant, and trained over the face of a house, or other rection, the circumstance of its blooming before the leaves are expanded, though ot in itself an uninteresting one, is a thing which, we think, might properly exercise he attention and inquiry of the culturist, in order to associate it with some other lant which would supply the verdure that is lacking at this season. It is our mpression that the Ivy, being the most verdant of all plants with a climbing abitude, might be very suitably blended with the *Wistaria* in clothing a wall, or ther building. From the spreading nature of the Ivy, it would necessarily require great deal of trimming and pruning, to prevent it from overrunning the *Wistaria*, nd smothering it. But this matter could be easily attended to; and if only half- -dozen bunches of bloom were here and there visible among the dark foliage of he Ivy, the effect would be most fascinating.

Perhaps a more proper companion for the *Wistaria,* would be the common aburnum, which, blooming nearly at the same time, having an allied character, nd possessing a greater profusion of bright-green foliage, might be happily ingled with it. That the Laburnum is capable of being readily trained against wall, is manifest by the many beautiful specimens which exist on the fronts of ouses in the neighbourhood of the metropolis. And, by intermixing the branches f the two plants in training, their similar racemes of blue and yellow blossoms ould create a peculiar, yet not unpleasing, contrast.

In treating the *Wistaria* as an open ground plant, cultivators have hitherto mployed it principally against walls and houses; and its singular adaptation for ecorating bowers, arbours, &c., seems to have been quite overlooked. It is emarkably well fitted for covering those trellised arches of wood or wire which re sometimes placed over walks in flower-gardens and parts of pleasure-grounds, s nothing could be more enchanting than to walk beneath an arch of its lovely looms. Those open-roofed pavilions or canopies, too, which are occasionally ade of rustic wood, and put up in similar places, chiefly for sustaining climbers, fford an equally good position for our charming *Wistaria.*

Arbours, moreover, and the retired erections which are common in some gardens, or the purpose of furnishing rest, or cool and quiet enjoyment, could be orna- ented with nothing so appropriate, in the way of climbers, as the *Wistaria;* for o look through its noble racemes of blossoms, fringing the edge of the roof, or urrounding the pillars along the front, would constitute the perfection of a fore- round to a scene either of rural beauty or of enriched and elaborate cultivation.

In regard to the hardihood of the *Wistaria,* we may observe that, because its arly blossoms, when opening on a southern wall, sometimes need, or appear to eed, protection from the easterly winds or late frosts of spring, the plant has been onsidered as partially tender. There is a mistake here, however, arising from the ircumstances peculiar to such positions. On a southern wall, the flowers of this plant appear sooner than they would otherwise do, in consequence of the greater warmth to which they are subjected. Hence, they are exposed, at times, to a degree of injurious cold, which they would escape altogether were they standing where they did not receive such protection and stimulus. And this, besides being an argument in favour of the culture of this species as a pole-plant, or shrub, or trailer over rockwork, is a proof that it is hardy enough in itself when not artificially excited. In fact, it seems to be fully as hardy as the common Laburnum.

Were we to fill the whole of one of our Numbers with a dissertation on the merits of this plant, and the varied modes of growing it, and the ease with which the smallest cultivators may both obtain and manage it, we should not be able to do it justice. But we hope we have said enough to spread its cultivation to a far wider extent than it has hitherto reached, and to give it that diversity which is so essential to the production and maintenance of interest.

ON PLANTING SHOWY SHRUBS IN MASSES.

In the practice of landscape gardening, opinions are almost necessarily of a widely diversified character relative to points of detail; most individuals having their own peculiar views as to the arrangement of those minor objects which constitute the several parts of a garden scene. And it is perhaps well that such is the case; for, otherwise, we might be constantly burdened with that ceaseles uniformity which would disgust rather than please; since, however excellent any particular style may be in itself, it always produces weariness if invariably carried out in precisely the same manner.

The arrangement and grouping of trees and shrubs may be taken as an illustration of the circumstance to which we refer. Some professors have been strong advocates for the planting of these in beds or clumps, according to their natural relations; and others have so vividly perceived the objectionable nature of this plan, that they have perpetually adopted indiscriminate mixtures, for the sake o obtaining that variety of aspect which so much pleases the eye. A few, again pressing the latter purpose still further, have practised the planting of single specimens to an extent which seems incompatible with any great and striking effects.

Now, while we by no means consider the collecting of shrubs and trees int families applicable as a general rule to ornamental gardening, inasmuch a irregularity without its beauty, and sameness without unity, would be unavoidabl occasioned; there are tribes which may be appropriately grouped, according t their natural affinities, especially when the species have been hybridized int numerous varieties. Rhododendrons, and some other American plants, wi exemplify this.

As to those general assemblages of trees and shrubs, in which species of th most different characters are associated, they are unquestionably preferable to any other kind of grouping, provided a due regard be kept to the preservation of some kind of unity and expression. It is mostly considered, among the ordinary planters of gardens, that, if every plant in a group be different from its neighbour, enough has been done in the way of arrangement. This, however, is very erroneous. There ought to be a harmony preserved throughout the whole—a blending and yet a contrast of forms—a variety as to the season for the development of foliage and flowers, so that there be some interesting object in every part of the group, at almost all periods, and not too many in one place—which requires the utmost experience and knowledge, and forms one of the last attainments of a planter.

In respect to single specimens, they are admirably fitted for creating striking effects, and exhibiting elegant outlines, if judiciously and rather sparingly employed. On a large lawn, interspersed with groups, or so arranged as to compose a group of themselves, they are especially beautiful. But when a lawn is so thickly studded with them as to leave no broad glades of grass for the eye to rove over and rest upon—particularly if they are not intrinsically ornamental enough to be calculated for standing out alone, and being viewed from every point—they become extremely displeasing. Nothing, in the whole range of gardening, is more distasteful than a fine lawn dotted all over with isolated specimen plants, and having no large open spaces to give it breadth and repose. If it be on a level, or nearly so, the deformity is still greater.

Decidedly the best position for solitary specimens of shrubs is in retired parts of a garden, where nooks or small open plots of grass occur, and where the plants will both be seen to advantage and be in character with the spot.

But we purpose here to speak more immediately of the desirableness of making groups of one species of shrub, or of several varieties of the same or allied species. In heterogeneous mixtures, there is manifestly at all times a scantiness of inflorescence, only here and here a shrub being in bloom at the same period. Single plants, also, are alike deficient in that amplitude of blossom which is requisite to the production of a very grand or imposing display.

An allusion to the modern practice of filling the beds of the flower-garden, will show the kind of characteristic which we wish to see more frequently mparted to the clumps of shrubs which are used in diversifying the lawn. This style has, indeed, been adopted in some places, though by no means so commonly as it ought to be, and only to a limited extent as respects the objects so grouped.

Masses of Rhododendrons are far from being rare in pleasure-ground borders; yet they are not so usual in detached beds, which are more interesting. Azaleas, too, are sometimes met with in the like circumstances. And to say that both of these tribes have a most glowing aspect, when thus brought together, and presenting a sheet of varied blossom, is but cold praise. A large bed of the best varieties of *Azalea* is among the finest things in creation, when blooming freely.

Kalmia latifolia is another excellent plant for growing in a mass, since, in good seasons, the entire surface of each specimen will be clothed with flowers, and thus a robe of delicate, wax-like bloom will be spread over the whole bed for a considerable period.

For the purity and snowy whiteness of its numberless blossoms, and the compactness of its habitude, the *Leucothoe* (*Andromeda*) *floribunda* is likewise a valuable thing for small beds. Amongst a number of darker and warmer-coloured masses, it would give a lovely relief; and, even by itself, its own dark green foliage, and the bright verdure of a lawn, would sufficiently throw out the whiteness of its inflorescence.

Several Heaths, and various American plants which do not occasion much display when planted singly in the borders, acquire an astonishing degree of interest if placed in masses, so that the specimens can run into each other. Such is the power of the sun on most species of this class during the hot summer months, that they can seldom gain sufficient strength to resist his prejudicial influence when they are standing alone. But as soon as they are collected into masses, they speedily unite their branches so efficiently that no amount of drought or solar heat seems afterwards to harm them.

For a proof of this fact, from analogy, which any one may examine and test by an hour's observation, we would refer to moorland tracts or rocky hills where peat abounds, but where the heath and other plants do not altogether cover the ground. Patches of different Heaths, or of the pretty *Vaccinium* or *Oxycoccos*, from two to four feet in diameter, may be seen flourishing in the greatest luxuriance; while smaller pieces, composed of only one or two plants, have been withering and dying during the past month. Obviously, the grouping of the specimens has protected them from the injuries of exposure, and given them their peculiarly healthy and beautiful appearance.

Beds of roses are so universal, that we need but just glance at them with the view of establishing the propriety of grouping flowering shrubs. Where the situation will admit of it, and a higher refinement is not desired, a few clumps of Lilacs would make a glorious feature in a pleasure-garden, garlanded with their handsome flowers in the month of May. A bed of dwarf Honeysuckles, also, pruned into bushes, would be an enchanting object. Masses of Fuchsias, moreover, will soon, we trust, be as common as gardens themselves and the love of flowers; for they are some of the most elegant of our summer embellishments, and almost as hardy as the *Hydrangea*. The latter plant is a splendid thing for grouping; its large heads of flowers being so well fitted for giving breadth of effect.

Probably one of the showiest of all plants for placing in masses, and one which is so peculiarly attractive on account of the earliness of its flowers, is the *Ribes sanguineum*. We were vividly reminded of this on witnessing a quantity of it planted as a hedge in one of our largest provincial nurseries. Thus treated, its showiness was perfectly dazzling, and we were compelled to acknowledge that we never before had a true conception of its real magnificence. Planted in a group of six or eight yards in breadth, on an ample lawn, we should think it would be transcendently rich.

A few species of *Spiræa*, and *S. ariæfolia* in particular, would make exceedingly striking masses on a lawn. *Cydonia japonica* and its pale-flowered variety might likewise be effective, although they hardly send enough of their flowers to the surface to adapt them for groups, without a good deal of pruning.

Many more shrubs of an ornamental character, and easily procured, might here be pointed out as appropriate for the end under notice. But we have indicated a sufficient number to serve as an explanation of our object, and as a guide to the rest. The main idea that we have sought to enforce is, that the tameness of lawns in general, and the want of occasional bursts of splendour among the groups scattered over them, may be met by introducing masses—more or less ample, according to the natural size of the plants, and the extent of the place—of one species of ornamental shrub, or several varieties of the same or similar species. A brilliancy and impressiveness, superior to anything attainable by other means, would thus be imparted.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS.

BARKE'RIA SPECTA'BILIS. "For the opportunity of figuring this lovely plant, I am indebted," says Sir W. Hooker, "to the kindness of Mrs. Wray, of Cheltenham, in whose collection, and that of the Horticultural Society, at Chiswick, it has been, as far as I am aware, alone known to produce its lovely and most delicate blossoms; 'the secret,' as Mr. Bateman observes 'of its success with Mrs. Wray being, obviously, the comparatively moderate temperature maintained in her stove, and which appears to be exactly adapted to the Orchidaceæ of the more elevated districts of Guatemala.' Baskets filled with moss, or blocks of wood, are found to be most congenial to the roots of Barkëria; 'in peat,' continues Mr. Bateman, 'they perish directly. It is a handsome plant, with stem-like pseudo-bulbs, four or six inches high, and bearing on the upper part two or three alternate dark green leaves of a strong leathery texture.' Eight or nine flowers, with spreading sepals and petals of a delicate lilac hue, slightly marked with darker spots, and a large undulated yellowish lip, spotted and tipped with purple, and bearing three parallel elevated plates gradually falling away towards the extremity, are produced on a terminal peduncle having at its base a long brown terminal scale. When several of these peduncles are borne on one plant, they form a showy and delightful object." *Bot. Mag.* 4094.

CE'REUS CRENA'TUS. "A most remarkable plant, belonging to the winged section of Torch thistles, according to Pfeiffer, which Link regards as a particular genus, and calls *Phyllocactus*. It is the finest thing yet known, of its class, with white flowers, and will, doubtless, prove invaluable as a breeder; for its habit is beautiful, to say nothing of its magnificent flowers, which rival the *night-flowering cereus*, but open in the day-time. When produced last month at the exhibition in the Horticultural Society's Garden, it received the highest medal offered for new plants. Let us only imagine a cross between it and *C. speciossimus* or *Ackermannii*. For the following information respecting it we are indebted to Mr. Booth. 'This fine species, with several others, was forwarded from Honduras, in 1839, by George Ure Skinner, Esq., and presented to Sir Charles Lemon, Bart., M.P., with whom it flowered at Carclew, in May 1843. Although similar in some respects to *Epiphyllum latifrons* of *Bot. Mag.* fol. 2692, it proves to be perfectly distinct and far more desirable, on account of its flowers opening in the day-time, and continuing expanded for nearly a week, whilst those of the one referred to open in the evening, are in perfection at midnight, and finally close a little before sunrise. It is also proper to state that, in addition to their other recommendations, the flowers of this species are deliciously fragrant, which will no doubt render it a most valuable acquisition to the admirers of this singular tribe of succulents.' The plant grows about two feet high, with large spreading branches, usually flat and broad, of a beautiful rich, shining grass-green, with large rounded teeth along the edges, and a very prominent midrib. The flowers are produced near the extremity of the shoot, and have a slightly curved tube about four inches long, and numerous pale cream-coloured petals of a delicate texture, forming a circle several rows deep, about five inches in diameter, from the centre of which a great number of filaments, about two-thirds the length of the petals, are protruded. Before expanding, the flower-buds are of a brownish pink colour." *Bot. Reg.* 31.

CEROPEˋGIA OCULAˋTA. This plant was " raised in the stove of the Royal Botanic Gardens, at Kew, from seeds sent from Bombay, by Miss Jones. It is extremely handsome, and very curious, as are the *Ceropègias* in general, in the structure of the flowers, which, in this case, represent the head of a snake with a green snout, and eye-like spots above the neck, or narrow part of the tube. It is, in many respects, allied to our own *C. vincæfolia* from the same country, but the flowers are larger and handsomer ; the corollas having a much more inflated base, free from spots, a very differently marked limb, and a different form of the corona staminea (nectary). It is a ready growing plant, flourishing in a good heat, and it produces its flowers in September." It has a slender, twining habit, and smooth herbaceous stems, on which the heart-shaped, long pointed leaves are rather distantly produced, opposite to each other. The flowers are collected into umbels of four or six, on a short, purple peduncle issuing from the axils of the leaves, and are quite as remarkable for their singular colours, as for their unusual form. *Bot. Mag.* 4093.

DIˋSA CORNUˋTA. " This charming plant was obtained from the Cape of Good Hope, together with the more splendid *Disa grandiflora*, and other rare Orchidaceæ, in the summer of 1843, to the Royal Gardens of Kew, and it bloomed during the month of December of the same year in a cool stove. The plants then died down to the roots, and it is doubtful if we shall succeed in flowering the same root a second year, so little is understood of the proper treatment of Cape bulbs and tubers. It is certain the roots often suffer from being taken up from their native soil at an improper season ; and doubtless, too, we have much difficulty to contend with in the change of seasons they must undergo in our northern hemisphere, and the want of hot sun to ripen the roots in their dormant state. There is a charming mixture of green and white and purple in the flowers of this plant, which contrasted well with the gay and gorgeous blossoms of the *Disa grandiflora* that stood beside it." Including the spikes, it grows about a foot high, and has a green stem spotted with red, and leafy to the summit, the lower leaves sheathing it at the base, and also spotted with brownish red. *Bot. Mag.* 4091.

EPIDE'NDRUM PTEROCA'RPUM. We cannot say much as to the beauty of this plant, which flowered with Messrs. Loddiges, in December 1842. It, however, presents a remarkable instance of the formation of broad wings by the fruit, which, when ripe, has three of them of considerable size. The flowers are a brownish green, with a broad, rolled-up yellow variegated lip, whose middle lobe is whitish. It is a native of Mexico, and closely allied to *E. tessellatum*. *Bot. Reg.* 34.

LŒˋLIA MAJAˋLIS. This is a handsome little plant with roundish pseudo-bulbs, and oblong lanceolate leaves of a thick coriaceous texture. The flowers are borne on a short scape, and are about six inches across. The lip is blush-coloured, deepening towards the extremity, and prettily spotted, or reticulated. It is a native of Oaxaca, where it inhabits very elevated situations. *Bot. Reg.* 30.

LONI'CERA DIVERSIFOLIA. " In many respects this Himalayan shrub is much like the common Fly Honeysuckle (*L. Xylosteum*) ; from which it principally differs in its flowers being nearly or quite stalkless, and much larger. Dr. Wallich first received it from the Mountains of Gurwhal ; he afterwards procured it from Kamaon : according to Dr. Royle it is common on the mountains of the North of India. In a wild state it sometimes becomes small-leaved, and approaches the common *Xylosteum*, but its stalkless flowers still distinguish it. By some mistake, it is included by De Candolle among his *Nintooas*, a set of climbing two-flowered species hich belong to the genus *Caprifolium.* This is a hardy, middle-sized shrub, which thrives in ny good garden soil, and flowers during the months of May and June. It is easily increased by uttings of the half-ripe wood, if treated in the same way as those of the common Honeysuckle. t was raised from seeds received from Dr. Royle, from the north of India." *Bot. Reg.* 33.

Mori'na longifo'lia. "A very handsome and a hardy plant, which few persons, perhaps, at he first aspect, would suppose to be a congener with the *Fuller's Teasel:* yet such is the case. t is entirely an Oriental genus. The original species found in the Levant by Tournefort, is, in any respects, nearly allied to this, but the leaves are decidedly smaller, and the bracteas uch narrower; and both are far more spiny, and the whorls of flowers are much more istant. The lobes of the calyx are entire or bifid in both species, and I do not in any way see ow the *M. Wallichiana*, of Dr. Royle, is different from this. That gentleman's *M. Coulteriana* eems to have the long coarse spines of *M. Persica.* Our *M. longifolia* was discovered by Dr. Vallich in Gossain Than. Dr. Royle found it at Mussooree, and on Choor, as well as on the ountains of Cashmeer. We also possess specimens from Lady Dalhousie, gathered on Whultoo, n the Himalayas, at an elevation of 10,673 feet above the level of the sea." It is an herbaceous lant, flowering in whorls, upon a stem usually eighteen inches or two feet high. When the lowers first expand, they are of a delicate, pale rose colour, but deepen with exposure into a ich, soft carmine, sinking almost to white at the margins. The lower or radical leaves are ery long, and those of the stem gradually become shorter. *Bot. Mag.* 4092.

NEW OR INTERESTING PLANTS FLOWERING IN THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

A'erides maculo'sum. A new species exhibited at the Horticultural Rooms, in Regent-treet, in the early part of last month, from the Nursery of Messrs. Rollisson, of Tooting. It pproaches more nearly to *A. Brookii* than any other, but the peduncle bearing the inflorescence s branched, instead of being simply racemose, as in that species and *affine.* Towards the extre-ities the petals are bent forward, and with the lip form a slightly concave cup-like flower. From *. odorata* they are easily known through the absence of the curious articulation in the labellum, hich distinguishes that species from the rest of the genus. The size of the flower is intermediate etween *A. Brookii* or *crispum*, and *A. affine.* The sepals and petals are prettily spotted with urple on a light ground, and there is a large blotch on the lip of a similar tint, with much of the ame delicate softness so pleasing in other large flowered species. Another recommendatory uality is the delicious sweetness which the flowers exhale continually. The leaves are large and road, of a full rich green colour. It was received by Messrs. Rollisson some years back from Bombay. It has a habit like the other species, and will, consequently, be most suitable for ultivating on a block of wood, or in a basket filled with moss, to cover the lowest roots and aintain them in a more uniformly moist condition, and suspended a short distance below the oof, in a warm and humid atmosphere.

Epa'cris minia'ta. Lovely as are many of this genus, when well cultivated and flowering in erfection, there is, perhaps, none that can vie with the present in point of beauty, certainly none hat excel it. It is an entirely new species, lately introduced by Messrs. Loddiges, of Hackney, n whose nursery several handsome specimens are now flowering. At first sight it appears to ear a strong resemblance to *E. grandiflora*, but this is chiefly owing to a similar disposition of olour, as it is markedly distinct in other respects. The leaves of *E. grandiflora* are produced on hort petioles, and the segments of the flower limb scarcely expand. In *E. miniata* the leaves re more decidedly heart-shaped and quite sessile, and the limb of the flower is completely xpanded and much larger. The tube, too, is deeper and brighter in colour, which is rendered et more conspicuous and pleasing from the greater purity of the white termination. The flowers re produced all along the shoots, from the insertion of every leaf, and sometimes extending or a foot or eighteen inches, each turning to one side, forming a long line of pendent blossoms.

Franci'scea hydrangeæfo'rmis. Plants of this species have been some time in Messrs. Low's and some others of the London nurseries, without producing flower; perhaps chiefly wing to the desire to obtain young plants from cuttings. The first specimen known to flower in his country is one now in bloom at the Royal Botanic Gardens of Kew, and lately shown at a eeting of the Horticultural Society in Regent-street. The flowers are about the same size, and much like those of *F. uniflora*, but they are arranged closely in heads—a character which h procured for the plant the above specific appellation. The leaves are large, of an oval for tapering a little towards the base. It is a stronger growing plant than the others, and like to form a much larger shrub. If carefully pruned to form a close bushy plant, it will be ve useful in the stove, especially as the flowers are very fragrant.

Gloxi'nia tubiflo'ra. This species has a very different appearance from its congene The flower-stems are about two feet long, and quite erect, bearing a few large white or crea coloured, gracefully curved flowers, at the top. The tube is rather narrow for the length, co pared with other species, and has a wide spreading limb. It is caulescent, and has moderate-siz foliage, nearly elliptical, with a rough wrinkled surface. It grows well in a greenhouse, if not t freely watered.

Gloxi'nia di'scolor. One of the most abundant flowering species in cultivation. The ste grows about six or eight inches high, and terminates in a large tuft of flowers, supported peduncles four or five inches long, and spreading on every side. The colour is a very soft lil blue, becoming gradually paler, as it approaches the throat of the tube, where it is almost white. plant now flowering, in the nursery of Messrs. Henderson, of Pine-apple Place, has between 30 a 40 flowers in one tuft. The leaves, however, are the most remarkable feature : they are ve large, and have thick yellowish green veins, the remainder of the upper surface being da green, and the under side a deep blood-colour. The easiest mode of culture is to start it in growth with a moist bottom heat in a pit or frame, where it may remain till it flowers, when must be taken to a rather close greenhouse. Through the winter it may be kept on a dry she in an airy place.

Hi'ndsia viola'cea. Messrs. Veitch and Sons have exhibited this most beautiful plant, whi they have recently introduced from Brazil, at the late Floral meetings, at Chiswick and Regen Park. It is much like the plant figured in a previous volume, as *Rondeletia longiflora* (n called *H. longiflora*), but infinitely superior to it in beauty. The branches are much strong and clothed with larger leaves, resembling some of the *Melastomas* in appearance. The flowe also are proportionately larger, of a very thick fleshy texture, soft and smooth as the fin velvet, and of a rich violet hue. It will be a very useful plant in a collection of stove or wa greenhouse plants.

Lyca'ste. A new species received by Messrs. Loddiges, from Marachaibo, through Mr. Lind has recently flowered in their splendid collection, at the Hackney nursery. It has long narro pointed petals of a dull olive yellow, and a smaller lip of a clearer hue, and curiously fringed the margin on each side. It has large pseudo-bulbs and foliage like *L. cruenta*, but it is ve inferior to that species. A plant has also flowered in the collection of S. Rucker, Esq., Wandsworth.

Onci'dium co'ncolor. This species, though one of the handsomest of *Oncidia*, is, neverthele rarely seen, and yet more rarely flowered. A handsome spike was produced in the stove W. C. Alston, Esq., of Elmsden Hall, and exhibited at the last Regent-street meeting. It h flowers with a rather long labellum of the brightest and purest yellow, and as they are produc sufficiently close together, and are of large size, they are very showy. It should be grown in basket of very loose peaty earth, mixed with a few small broken potsherds ; and during t winter season it should be placed in an airy situation, and freely exposed to all the light possib This and many allied species are extremely liable to have the leaves injured from rot and dam wherever this appears a little quick-lime well rubbed over the decayed portion will at once arr the progress of the disease, without being in the least injurious to the specimen in other respec

Pleurotha'llis recu'rva. Although the plants of this genus are mostly insignificant a inconspicuous, yet they are interesting to those who love to examine Nature in all her forms ; a they are far from being void of beauty, though the smallness of their parts prevents them fr affording that showy appearance, so common amongst other families of Orchidaceæ. The leaf *P. recurva* is broad and thick, with racemes of flowers proceeding from its base, and unable support themselves, lying gently upon it. The sepals are large and broad, compared with other parts of the flower; and the two lower adhere together, but separate before the flow decays. The upper one is colourless about half its length, the extreme portion being a d purple violet ; the two lower are wholly of that colour. The petals are very minute and whi and the lip (also small) is bright violet.

Thunbe'rgia chry'sops. Perhaps there has not been a finer plant introduced for some years ian the present handsome stove species. It far surpasses all other members of the genus yet nown in England. The flowers are produced singly from the axils of the leaves, and have a ng tube, very narrow at the base, but swelling towards the throat, and expanding into a large reading limb. The interior of the tube is clear yellow, and as the throat is about half an inch ide it is readily seen. This is surrounded with a ring of a bluish colour, like the hue of the ower of *T. Hawtayneana,* which is again bordered by a rich violet colour, occupying the chief ortion of the spreading segments. Before the flowers expand, the buds are rather pointed, and most black, glistening brightly as though washed with gum. The leaves are heart-shaped, on ng foot-stalks, and are irregular at the margins, like those of *T. alata.* A plant from the Kew ardens was exhibited in Regent-street, in the beginning of June. It appears likely to be an oundant flowering species, and will form a delightful companion to the white, buff, and orange owers of *T. leucanthe, T. alata,* and *T. aurantiaca.*

OPERATIONS FOR JULY.

In this month, as, indeed, in all others, much of the work to be performed must be regulated y the state of the weather. Everything in the outdoor department must be so provided for, that either extreme wetness nor drought may entirely frustrate the cultivator's intentions, or wholly isappoint his hopes. If the tender plants, transferred from the greenhouses and frames to the rterre, in May and the early part of the last month, have been planted with an eye to this ariable and uncertain condition, so as to secure a medium state that will readily admit of nprovement should either extreme prevail, little will be required now.

To correct aridity and intense sunshine, or a continuance of cold and cloudy days with a superoundant fall of rain, it may, however, be necessary to employ some ameliorating means. To ry the former, shades may be interposed in stoves and greenhouses, where the plants are nder, and water applied where more moisture is needful ; to avoid the latter, let every facility e employed to promote the quick passage of water from the immediate vicinity of the roots, and ie branches should be kept from becoming too crowded.

Where shade is deemed requisite to prevent the injury likely to result from a direct exposure the rays of the sun, it must be borne in mind that light is yet necessary to the maintenance of igorous health and beauty. Plants will require a diffused light to grow and increase with ndiminished strength, even where its direct influence is insupportable. Shade, therefore, must ever be interpreted to mean darkness, and it must only be applied during that part of the day hen the rays of the sun are most intense and injurious. In the morning, when the plant is efreshed by the partial suspension of its digestive powers, and its parts full of moisture, absorbed uring the night, a warm sun will be less injurious than in the after part of the day, if the houses re properly ventilated. But towards the evening of a clear day, unless the quantity of moisture hich a plant is able to obtain from the soil is equivalent to the expenditure, a warm sun will ause it to flag, or droop its foliage, and the extremities of the growing parts. Therefore the ondition of the plant, and the peculiarities of the weather, will each form a subject equally nportant, and necessary to be regarded conjointly in the application of shade. Houses built ith a span roof are superior on account of the advantages which they possess for the application f shade. The eastern side may be covered in the morning, and the western in the afternoon, ius admitting sufficient light through the one side, and preventing the hurtful effects of immediate nshine, by having a slight screen on the other.

In every place where plants are grown in pots, some degree of shelter will be indispensable, hether they are placed in the greenhouse or the reserve garden. The destructive effects of the irect rays of the sun falling on plants, is as much, or, perhaps, more owing to the pot or tub in hich the plant is grown becoming too much heated ; and, consequently, the soil immediately irrounding the major part of the most active roots is deprived of a sufficiency of moisture. lants grown in the border of a conservatory, or plunged amongst ashes in their pots, or their roots protected by some similar material, have little occasion for the interception of light, unless indeed, they are naturally found growing beneath the shade of other plants of larger dimensions or in situations otherwise affording shelter.

Another means of diminishing the disastrous effects of a lengthened period of dry weather, wi be found in frequently loosening the surface soil ; and this is an operation that will also tend t render the garden more neat, if carefully raked afterwards. Mulching the ground,—thoug highly advantageous to many plants, and particularly useful in the vegetable garden,—is quit inadmissible in the pleasure ground, on account of its unsightly and slovenly appearance.

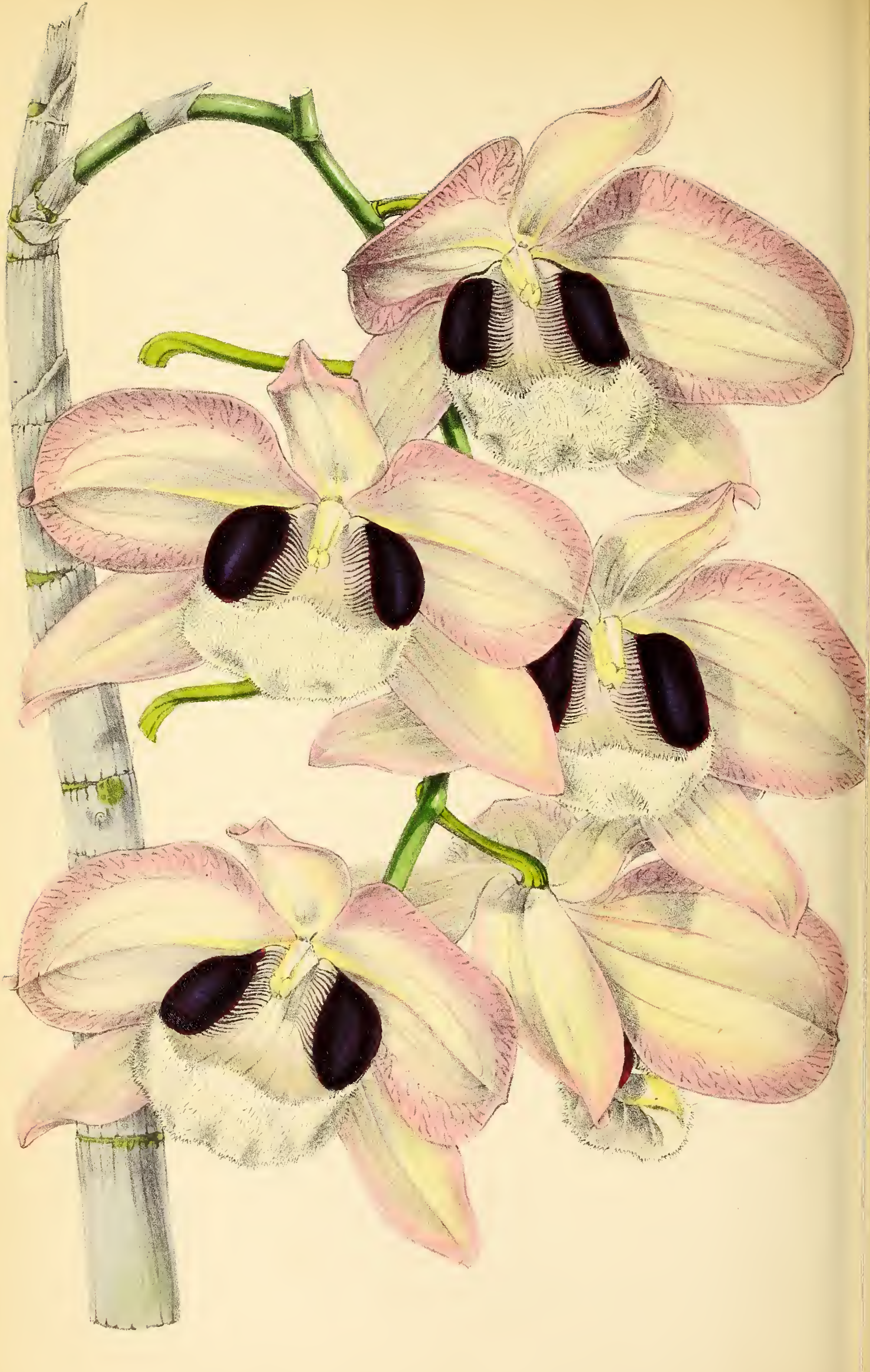
Little can be done to prevent tender plants suffering from too much wet, beyond providing ready passage for all unnecessary moisture, by having a suitable soil, and causing it to be wel drained. In low situations, or where the soil is of a retentive quality, borders should be raise a little above the level of the surrounding ground, but this must not be carried to so great a extent as to subject it to the liability of becoming too dry under contrary conditions. Greenhous plants, in pots, that have been turned out for the summer season into the reserve garden, ough to have a canvass covering placed over them, to shield them from heavy dashing showers, an rough winds.

Those greenhouse and stove plants that are beginning to mature their growth, will now requir less water, and as their parts gradually become firmer and less succulent, they may be inured t more sunshine. But to all soft wooded plants in active vegetation, an abundant supply of wate must be continued, taking special care at every application to administer sufficient to moiste every particle of soil about the roots. And when plants are about to develop a multitud of flowers, this precaution will be the more requisite, to prevent them from being shed befor they are ready to expand, and also to enable them to swell to their most ample dimensions The loss of bloom on the threshold of its beauty, and the diminutive size of others, compare with their ordinary magnitude, is most frequently caused by imperfect supplies, or negligenc in the administration of water.

Syringing on the evening of sunny days will also be extremely refreshing and invigorating Besides furnishing water for support, the leaves will be kept free from dust and filth, and contin fit for the exercise of their functions, as well as more bright and pleasing to the eye. Th progress of insects will be marred, in every case where they appear, without which no plant ca long remain healthy, or continue to grow with its wonted vigour. But amongst floweri specimens the syringe must be carefully used ; for, if water should be indiscriminately spread ov leaves and blossoms, the beauty of the latter will speedily suffer, and their duration wi be shortened. No water should, therefore, be allowed to fall upon them. In damp or du weather it is very injudicious to apply the syringe, save only occasionally to extirpate insects because, when water is given with too much liberality for the degree of light and heat, the plan will either be gorged with aqueous matter that they cannot assimilate, or in the case of delica rooted or succulent-stemmed species, they will damp and decay.

Continue to maintain the greatest possible degree of neatness throughout every part the grounds, and especially in the flower-garden, which will now be daily increasing in attractiv ness. The surface of each border not covered with trailing plants, must be kept neatly raked ar clear of weeds. When branches become too crowded, they must be thinned away, so that eve portion may be duly exposed, and enabled to display its inflorescence in the most favourable ligh Straggling shoots, and all that may have attained an undue ascendancy over those around ther must either be lopped away entirely, or shortened to throw out laterals. Where stakes are indi pensable, they must be concealed as much as convenience will permit ; and the plants secured them so as to appear as free and unconstrained as possible. Always avoid bundling them t closely together.

Those who are desirous of increasing their stock of *Roses* must be ready with their buddi knives ; and towards the middle of the month it will also be an advisable season for layerin *Carnations* and *Picotees* may also be layered. Cuttings may be taken of many border plants, prepare a stock for another season. *Pelargoniums* should be propagated and brought forward speedily as possible, to form handsome plants before winter. The shifting of *Chrysanthemu* ought never to be delayed after they require it, and the pots must be kept plunged in ashes soil. To increase their vigour, a little manure water may be occasionally supplied to them.



S. Holden, del & Lith.

Dendrobium Dalhousieanum.

DENDROBIUM DALHOUSIEÀNUM.

(Lady Dalhousie's Dendrobium.)

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDÀCEÆ.

Generic Character.—*Sepals* membranaceous, erect or spreading, lateral ones larger, oblique, connate with the column at the base. *Petals* higher than the sepals, and often larger, though occasionally smaller; always membranaceous. *Labellum* with a foot articulated or connate with the column, constantly sessile, undivided or 3-lobed, sometimes membranaceous, sometimes appendiculate. *Column* semi-cylindrical, very much lengthened at the base. *Anthers* 2-celled. *Pollen-masses* four, collateral, equal.

Specific Character.—*Plant* epiphytal, caulescent. *Stems* strong, terete, pendulous. *Leaves* ovate-lanceolate, obtuse, striated with purple. *Racemes* lateral, partially drooping, producing 8 to 12 flowers. *Sepals* oblong, obtuse, spreading. *Petals* somewhat broader, obovate, tapering towards the base. *Labellum* elliptical, concave, boat-shaped, with an acute, deflexed termination, and 7 slightly curved, transverse, unequal, partially elevated, purple streaks on each side, detached at the inner extremity.

Our pages bear ample evidence of the splendour of this extensive family, the pride of East Indian Orchidaceæ. Already we have figured fourteen, most of them noble species, and the beauties of many so nicely poised, that it would be difficult to say to which the palm of superiority ought to be awarded. The present beauteous addition is a worthy rival to most of its congeners, and if amongst them we find some to eclipse it in depth and brilliancy of colour, it is yet surpassed by few in magnitude, or interesting features.

Specimens were obtained by Mr. Gibson, the botanical collector of his Grace the Duke of Devonshire, from the botanic gardens of Calcutta, and by him transmitted to Chatsworth. Mr. Gibson never met with it in any part of the district which he explored. The Calcutta gardens were indebted for their plants to Lady Dalhousie, but it was unknown whence her ladyship procured them. Our plants, thus received, have continued to exhibit every symptom of perfect health, and have produced strong stems upwards of three feet in length, without manifesting any tendency to flower till last year, when a solitary raceme, which had begun to develop itself, was accidentally destroyed ere the flowers were unfolded.

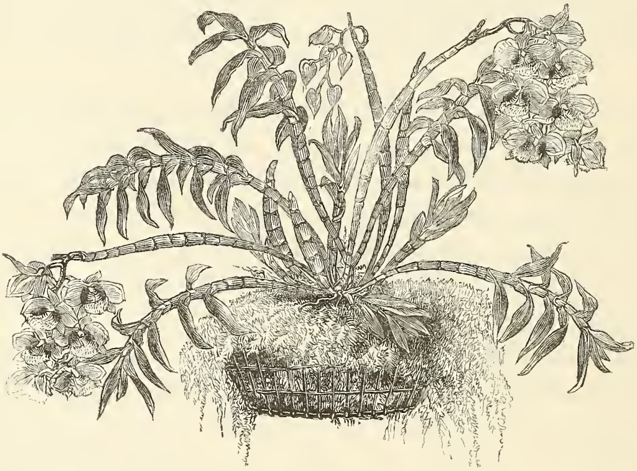
About two months ago, however, a specimen imported by Messrs. Loddiges, from the same gardens, flowered in the superb collection of those gentlemen at the Hackney nursery, and the coloured delineation on the opposite page was obtained through their obliging permission.

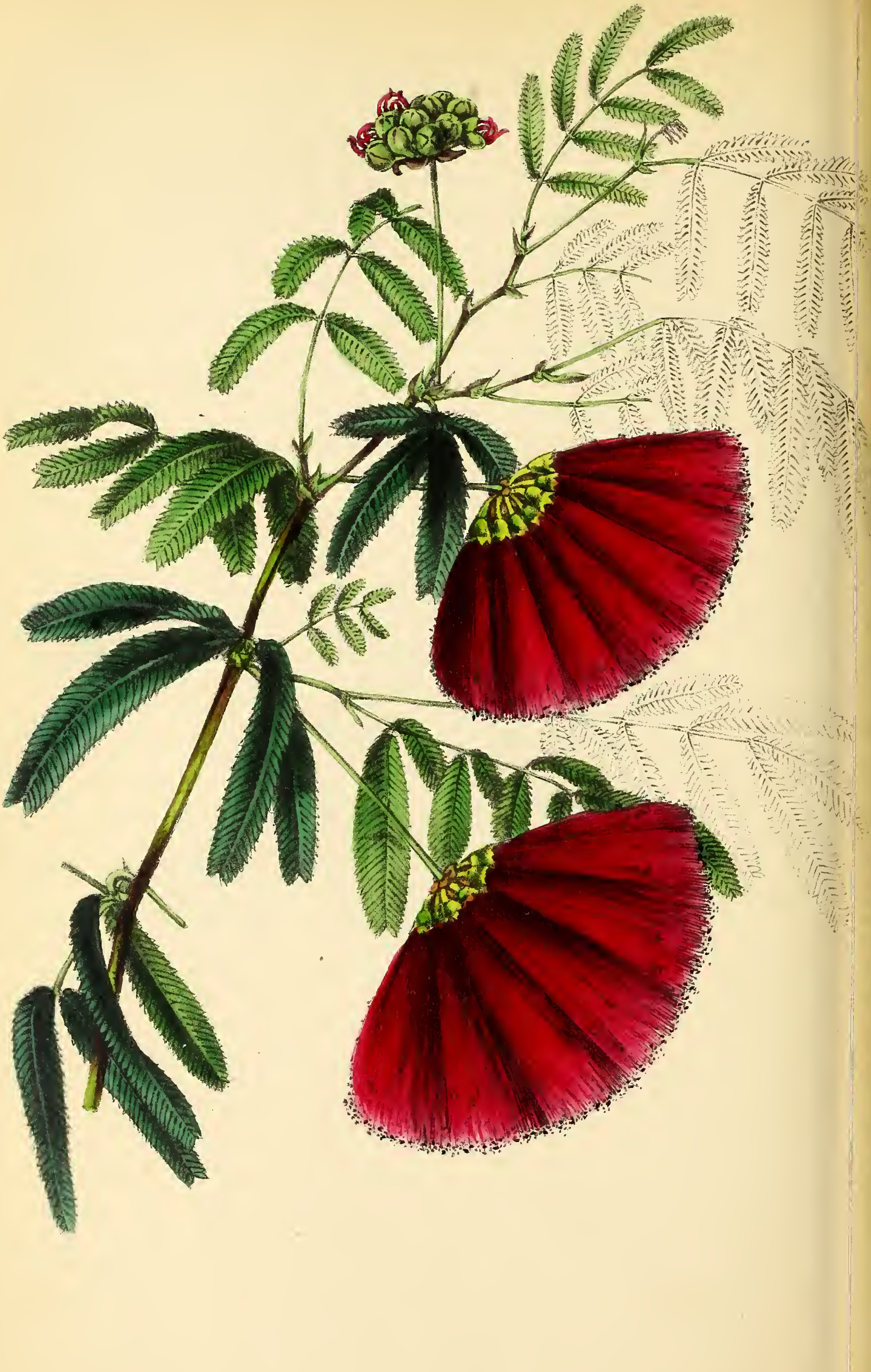
The gracefully bending racemes of flowers emanate from the upper portion o the defoliated stem formed the preceding year. The blossoms have a very handsom lip, shaped somewhat like a boat, with an obvious peculiarity in the raised paralle coloured lines on each side, pointed towards the middle, and detached for a shor distance from the body of the lip at the innermost termination.

In the Calcutta gardens it produces its flowers in the dry season, a circumstanc meriting attention in its treatment in an artificial climate. Together with th majority of *Dendrobia* this species is most appropriately cultivated when attache to a block of wood with its roots enveloped in moss, and depending from the pillar or the roof, so that the stems may hang loosely over the block. It may also b successfully managed in pots, but has a less ornate appearance.

Dr. Wallich bestowed the specific name upon it, in compliment to the nobl lady who supplied him with the plants.

The vignette below exhibits the character of the species.





S. Holden del & Lith

Inga pulcherrima

ÍNGA PULCHÉRRIMA.

(Prettiest Flowering Inga.)

Class.
POLYGAMIA.

Order.
MONŒCIA.

Natural Order.
LEGUMINÒSÆ.

Generic Character.—*Calyx* 5-toothed. *Petals* five, connected together into a five-cleft corolla. *Stamens* numerous, exserted, sometimes joined together a short way at the base, and sometimes a great way up. *Legume* broad, linear, compressed, one-celled. *Seeds* sometimes imbedded in pulp, sometimes in farina, and sometimes, though rarely, enwrapped in a pellicle.—*Don's Gard. and Bot.*

Specific Character.—*Branches* slender, spreading, villous when young. *Leaves* with four or five pair of pinnæ, of nearly equal length, each pinna bearing from 20 to 26 pair of small, linear, obtuse, closely imbricated leaflets, adpressedly ciliated at the edges. *Petioles* glandless, clothed with a few scattered hairs. *Flower-heads* solitary, pedunculate, pendulous.

In a genus of plants like the present, abounding in noble trees and handsome shrubs, airy and elegant in their foliage, and bedecked with specious inflorescence, the propriety of bestowing a name denoting superlative beauty upon any individual species may be somewhat questionable. Whatever of hyperbole there may appear in that assigned to the plant before us, the beauty and loveliness of its characters entitle it to some corresponding epithet to distinguish it; and though there may be other species equally meriting admiration and distinction, there is none more worthy of ranking amongst the fairest ornaments of the tribe.

One hundred and thirty six species of *Inga* are enumerated by Don in his "System of Gardening and Botany," and it would appear from our catalogues, that fully one hundred of these have never yet graced a British collection. We may, therefore, hope that many, when introduced, will prove useful acquisitions to the stove or the greenhouse.

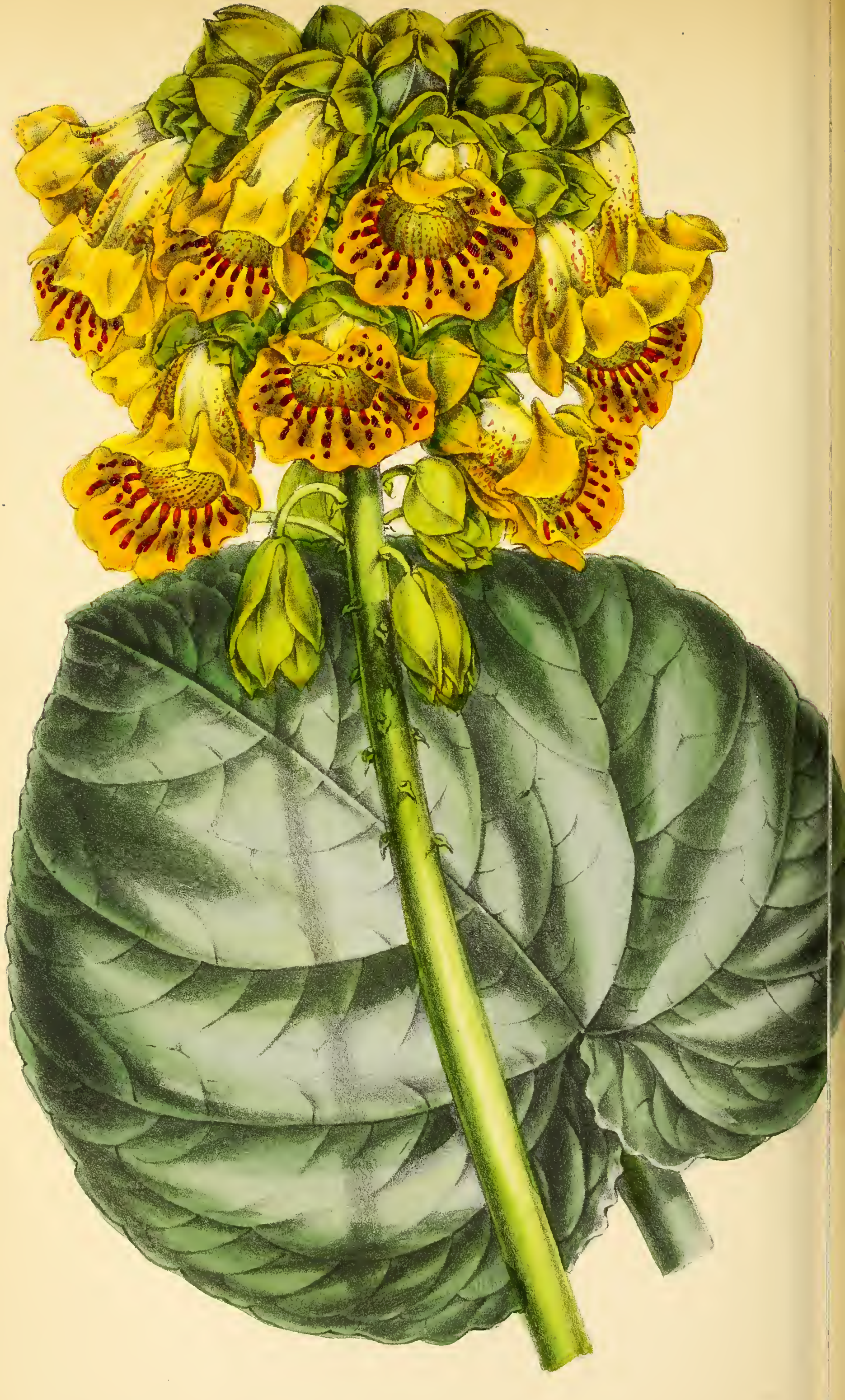
The accompanying figure was prepared from a specimen kindly furnished to us last February by Mr. Jackson, of Kingston, from whom healthy plants may be procured. Uniting with its superior ornamental qualities a propensity to disclose its beauties at a season when the general paucity of flower induces us to regard every fugitive blossom with a favourable eye, it is still more valuable. It bears a striking similarity in its general aspect to *I. kermesina.* It has, however, much smaller foliage, and the drooping tassel-like blossoms, though scarcely equal in size, shine with a deeper and more lustrous hue.

The irritability common to the leaves of many species of Mimosæ, and especially *M. pudica* and *sensitiva*, is also displayed, though to a less striking degree, in the plant under notice, particularly when grown in a warm stove. If the young leaves are pressed roughly by the hand, exposed to a strong current of air, or a sudden depression of temperature, they rapidly contract and fold together, but soon expand and raise themselves again to their usual position. When cultivated in the greenhouse the leaflets never expand, even in the brightest and warmest days throughout the whole course of the winter season.

In its cultivation, the chief things to be thought of, are the selection of a suitable medium for the roots, to provide a congenial atmosphere in the growing season, and afterwards conditions favourable to a suspension of vegetative activity. A light loam added to an equal proportion of peat and sand, enriched with well-reduced leaf-mould, may be used with propriety. A greenhouse temperature is decidedly most proper during the summer season, and till the autumn is far advanced. In winter it should be kept in the stove, where it may remain till May or June.

It is stated to be a native of Mexico, in Loudon's "Hortus Britannicus," and introduced to this country in 1822.

The generic title is a South American name adopted by Marcgraa, a naturalist who wrote on the Natural History of Brazil, about the middle of the seventeenth century.



S Holden del & Lith

Martynia lutea.

MARTÝNIA LUTÈA.

(Yellow-flowered Martynia.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
PEDALĬACEÆ.

Generic Character.—*Calyx* five-cleft, nearly equal, bracteate at the base. *Corolla* sub-campanulate; limb five-lobed, unequal. *Stamens* four, didynamous, two of them sometimes sterile, with always the rudiments of a fifth. *Stigma* bilamellate. *Drupe* or *capsule* oblong, bicornute at apex; the anterior horn sulcately toothed, containing a four-celled, woody nut; cells few-seeded. *Seeds* ovate, a little compressed, wingless, pendulous. *Radicle* superior.

Specific Character.—*Plant* an annual. *Stem* branched, clothed with glandular down. *Leaves* opposite, cordate orbicular, toothed, covered with glandular down. *Calyx* involucrated by two bracteas. *Corolla* large, funnel-shaped, orange-yellow spotted with blood colour inside. *Beaks* much longer than the pericarp. —*Don's Gardening and Botany.*

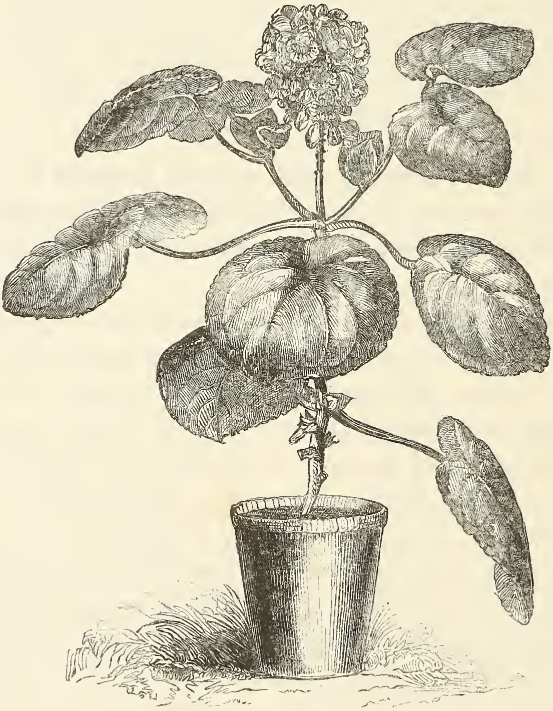
This neatly speckled flowering plant was first produced in England in the gardens of the Hon. and Rev. William Herbert, Dean of Manchester, who, in the year 1824, received seeds from the Brazils, and raised several specimens from them, which flowered in August the following year.

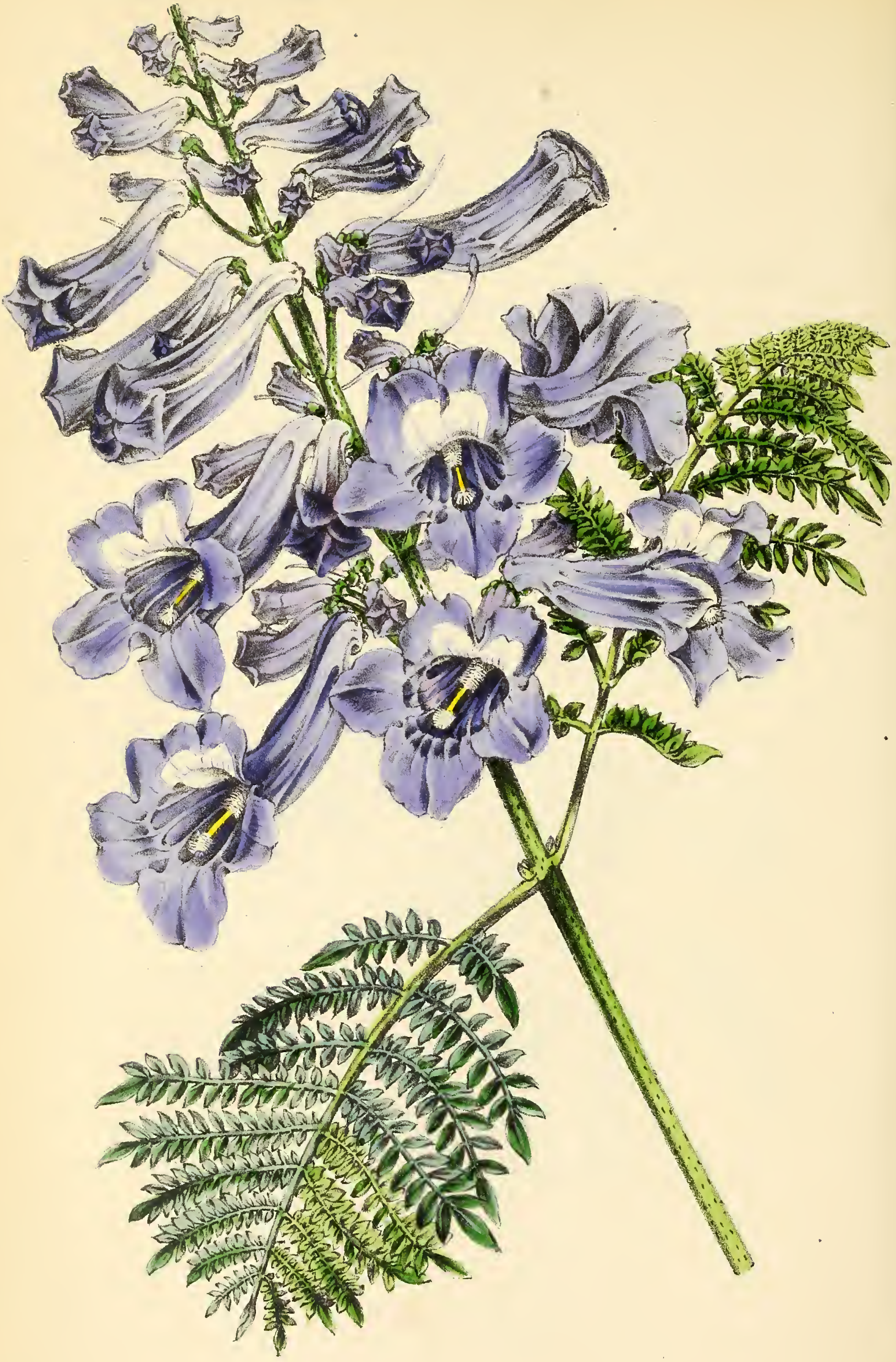
Like its congener of later introduction, the well-known *M. fragrans* from Real del Monte, in Mexico, as well as the majority of other known species, it is only of annual duration. On its first introduction it was cultivated exclusively in the stove, but has since been found to flower well in an ordinary greenhouse, if the plants have previously been grown in a warm pit with a genial bottom heat. Raised in this way, and hardened by exposure in an airy greenhouse, it may also, in favourable situations, be planted in the open border in a warm and sheltered place, on a dry soil. A rather poor earth will also suit it better than one abounding in rich nutritious matter; as the foliage, being copious and large, and the stems strong and somewhat succulent, are in danger of acquiring too much luxuriance, and attaining a size disproportionate with the inflorescence. And for the same reason a porous soil should be chosen in preference to one more retentive of moisture. In pot culture, a compost of a stronger quality will be advantageous, but it will still be advisable to circumscribe the roots in a moderately sized pot; and to give an occasional watering with liquid manure, rather than a larger pot, should they require additional nourishment.

The stems grow upwards of eighteen inches high, and emit a few branches, each of which are eventually terminated by a large cluster of closely aggregated flowers, about equal to those of the common foxglove of the hedges in magnitude, and somewhat similar in form. The beauty of the foliage, when not excessively overgrown, is of itself sufficient to recommend it as a desirable plant for the greenhouse in the summer season, when its acknowledged residents have been removed for the season. The flowers, too, are pretty, though perhaps inferior to some of its allies.

We were kindly permitted to take our drawing from a specimen which flowered in the month of October, 1841, in one of the greenhouses at Messrs. Lowe's nursery, Clapton.

The genus was named by Houston in compliment to John Martyn, F.R.S., Professor of Botany in the University of Cambridge, about the middle of las century, and author of several botanical works.





S. Holden del & lith

Jacaranda mimosifolia.

JACARÁNDA MIMOSIFÒLIA.

(Mimosa-leaved Jacaranda.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
BIGNONIACEÆ.

Generic Character. — *Calyx* campanulate, five-toothed; rarely tubular, truncate, entire. *Corolla* tubular at the base, very much dilated above, campanulate, ventricose beneath; limb bilabiate, five-lobed. *Stamens* four, didynamous, with a fifth longer sterile filament which is villously bearded at the top. *Anthers* one-lobed, in most species with an obsolete rudiment of another lobe; rarely two-lobed, with the lobes equal and diverging. *Stigma* bilamellate. *Capsule* broad, compressed, two-celled; valves thick, ligneous; dissepiment contrary to the valves, placentiferous on both sides. *Seeds* flat, transverse, with foliaceously-winged edges; outer testa coriaceous, rugosely plicate.—*Don's Gard. and Botany.*

Specific Character.—*Plant*, a tree with grey bark, nodose from cicatrices at bottom. *Leaves* bipinnate, with many pairs of opposite pinnæ (fourteen to twenty-four pair), each pinna bearing ten to twenty-eight pair of trapezoid-oval, oblong, mucronate, downy leaflets, the odd or terminal leaflet lanceolate, and longer than the lateral ones. *Panicle* large, terminal, naked, erectly pyramidal. *Flowers* drooping. *Corollas* silky, having the tube a little arched, and three times shorter than the throat.

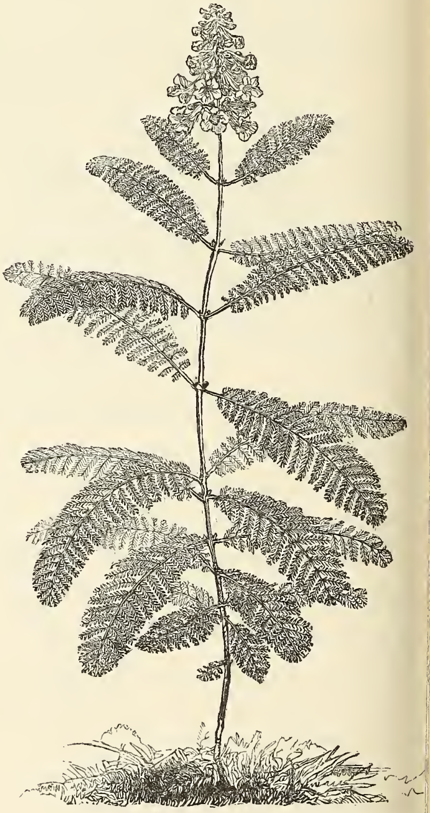
Synonyme.—*J. ovalifòlia*, R. Brown, *in Bot. Mag.*

If handsome flowers of large size, and a soft cerulean hue, borne in copious panicles standing conspicuously at the termination of the shoots, be any criterion of the worth of a plant, these alone must constitute the present species one of the fairest gems in Flora's garland.

Nearly all the several families which compose the natural order Bignoniaceæ comprise species that more or less merit the esteem of the culturist. They are chiefly plants of elegant habitude, and handsome foliage, many bearing large richly coloured, or elegantly formed flowers, and some even uniting all these recommendatory qualities. For the airy elegance of the many-cleft, *acacia*-like foliage of the present member of the tribe, its slender tree-like stems, and the beauty exhibited in the delicately soft azure hue of the trumpet-formed flowers, collected loosely together and standing erect, it is eminently worthy of extensive cultivation. To this we may add, that it will grow to a tree ten or twelve feet high, and, under skilful tendence, unfolds its blossoms freely.

It may be urged, perhaps, that this large size must exclude it from limited collections, and where economy of room is a material consideration. But this is, n reality, no objection, as specimens may be flowered when little more than six or eight inches high, and are perhaps more enchanting in this dwarf state than when allowed to grow to a stately tree. The plant from which we were courteously permitted to prepare our figure, in the Nursery of Messrs. Henderson, of Pine-apple Place, last April, was not more than fifteen inches in height, including the terminal panicle of flowers represented. This plant was one of a number (now on sale) raised the previous year from cuttings having no more than a single bud on each. These were obtained from shoots near the upper extremity of a large specimen.

The most approved system of culture is that which affords to the plant a warm and moist atmosphere, with a gentle bottom-heat, and a liberal supply of water, whilst in a progressive state. But as soon as the shoots cease to extend rapidly, the proportion of these elements must be diminished in the same ratio, and to improve the propensity to develop flowers profusely, the soil must be kept in a comparatively dry state throughout the winter season. The shoots must be pruned back as soon as the flowers fade. The most suitable soil is composed of about equal parts of loam and peat, to which may be added a little silver sand, and a portion of decayed leaves in a partially reduced state.



It is a native of Brazil, and was first added to the collections in this country in 1818.

Jacaranda is the native appellation of *J. brasiliensis*, and has been continued to the genus by modern botanists. The specific name alludes to the great similarity in the foliage to some species of *Mimosa*.

GARDENING AS A SCIENCE.

VEGETABLE PHYSIOLOGY.—No. VII.

The Functions of the Leaves now require attention. A concise view of he situation and structure of the vital organs has been taken in Article 4, age 81, of the present volume; the reader is, therefore, in a degree prepared to onsider the hypotheses which have been or are advocated, by leading authorities, f the offices which they perform in the vegetable economy.

In general terms it may, without hesitation, be asserted, that the leaves are mong the most important of the organs, inasmuch as they perform the functions f *respiration*, *perspiration*, and *elaboration* of the nutritive and specific fluids of he plant. The structure of the leaves leads to a shrewd suspicion of their vast onsequence, and when we have shown that it comprises a system of cells and *tomates*, that is, orifices or mouths (from *stoma*—Greek—a mouth), it becomes lmost self-evident, as some have asserted, that each leaf, and division of a leaf, is species of lung, or lobe, by and through which the vital secretions are prepared nd conducted.

In the first instance we shall allude to the substances produced in the leaves; nd, in describing these cursorily, we prefer an appeal to the authority of the hemists, Davy and Liebig, because, by the analysis which they have instituted, cts will be rendered quite evident, which will prove that, by the combination of the lements of the atmosphere alone, all the organic processes of vegetable maturity an be effected, thus leaving little to be performed by the roots beyond the intro-usception of a watery solution of a few *inorganic* metals and alkaline salts.

Sir Humphry Davy's arrangement of the *compounds found in plants* is made the following order:—1, Gum, or mucilage, and its different modifications; , Starch; 3, Sugar; 4, Albumen; 5, Gluten; 6, Gum Elastic; 7, Extract; , Tannin; 9, Indigo; 10, Colouring Principles; 11, Bitter Principles; 12, Wax; 3, Resins; 14, Camphor; 15, Fixed Oils; 16, Volatile Oils; 17, Woody Fibre; 8, Acids.

The properties, or rather the chemical products by analysis, of a few of the ove substances will be described according to the estimate of Davy; they will ow how simple, and yet how infinitely diversified are the instruments of nature. n one point we must previously caution the student. It is customary to say—nd too many take the assertion for granted—that a certain product *consists*, or is mposed of such and such elements. But this language is not correct, for it lsifies the judgment: thus, in citing (for example) the first of Davy's list—*Gum* -we read that—

"From the analysis of MM. Gay-Lussac and Thénard it appears that *Gum Arabic* contains in 100 parts, of *Oxygen* and Hydrogen *in the proportions necessary to form water*	57·77
"And of Carbon	42·23
	100 "

But gum, while such, is gum, and nothing else; no chemist could by an human means so re-combine the elements oxygen, hydrogen, and carbon, as t give them the form of gum. In truth, by the energy of heat, and the attractio of re-agents employed, a substance (as gum) is electrolysed, rent, and torn t pieces, and converted to gases. As, however, analysis acts equally on all th substances submitted to its energy, the gaseous, liquid, or solid products s obtained, become standards of comparison; and thereby we obtain data whence t infer that the real natural elements must, to a very great extent, correspond wit their developed representatives.

2. *Starch,* according to the same authorities, yields to analysis—

Carbon	43·55	Or in another view—Carbon	43·55
Oxygen	49·68	Oxygen and Hydrogen in the proportions to form water	56·45
Hydrogen	6·77		
	100		100

Starch forms a principal part of a number of esculent vegetable substances Sowans, Cassava, Salop, Sago, and all of them owe their nutritive powers princi pally to starch.

Potatoes contain much starch (*Amylum*), the quantity varying from abou one-eighth to one-sixth of the pulp; and from this product, or perhaps from th pulp itself, sugar can be, and we believe, is, prepared to a considerable extent The French are now in the habit of strengthening their clarets with starch suga in those bad, moist seasons when the grape-juice is deficient of the saccharin principle; and, as this sugar is analogous to grape sugar, it might be desirable t substitute it, in wine-making, for the less wholesome and congenial sugar of th "Cane," which experience proves to be improper for the preparation of our ow grape, currant, and other fruit wines.

"3. *Sugar,* according to the recent experience of Gay-Lussac and Thénar consists of 42·47 of carbon, and 57·58 of water or its elements. Lavoisier an Dr. Thompson's analyses agree very nearly with the proportions of 3 carbon, 4 oxygen, and 8 hydrogen" (*i. e.*, in *atomic* equivalents).

Thus, upon every authority, sugar, starch, and gum agree closely in the developed elements; and, therefore, we need not be surprised that sugar ma be readily produced from starch, and that all can be converted into oxal acid.

4. "*Albumen* is a substance common to the animal as well as to the vegetab kingdom." So Davy asserted, soon after its discovery in the kernel of the Almon Peach-nut, &c.; and the identity with animal albumen has been proved by Lieb and other modern chemists. Like the white of egg, which furnishes the mo familiar example of animal albumen, *that* obtained from vegetables is coagulat by the action of heat or acid, when mixed with water, even when 1 grain only diffused through 1,000 grains of water. Albumen is an azotised product; hen its approach to the quality of human blood. 100 parts of white of egg yield

arbon, 52·883; oxygen, 23·872; hydrogen, 7·540; azote, 15·705. In Liebig's nimal Chemistry, a most luminous view is taken of this analogy.

5. *Gluten* is another of the azotised products of vegetables: it is found, ccording to Davy, "in acorns, chesnuts, horse-chesnuts, apples, and quinces; arley, rye, peas, and beans; likewise in the leaves of rice, cabbage, cresses, hemock, borage, saffron; in the berries of the elder and the grape. Gluten appears to e one of the most nutritive of vegetable substances; and wheat seems to owe ts superiority to other grain, from the circumstance of its containing it in larger uantities." It is a tenacious, ductile, elastic substance, obtained by washing way the starch, from a paste made of wheat flour, and kneading it under a small tream of water.

Gluten of the grape is a chief agent also in the vegetable fermentation of wine.

8. *Tannin* is the astringent principle of a vast number of vegetable products, f which gall-nuts and oak-bark become the most familiar examples. "The haracteristic property of tannin is its action upon solutions of isinglass and jelly. kins consist almost entirely of jelly, or gelatine in an organised state, and are oluble by the long-continued action of boiling water." By the process of *tanning* he gelatine is fixed by the tannin in the fibrous tissue of the skin. When wine s fined by isinglass, the floating *tannin* is attracted, and falls down in the state of n insoluble compound of isinglass and tannin.

We need not enlarge on this branch of vegetable products, but shall come at nce to the consideration of those not soluble in water, and first of

No. 12. *Wax.* This is found pure in the leaves of some trees, and seems to be f the same nature as that produced by the bee.

The products are stated to be

Carbon	81·784
Oxygen	5·554
Hydrogen	12·672

r otherwise, carbon 81·784, oxygen and hydrogen in the proportions of water ·300—hydrogen in excess, 11·916.

13. *Resins* differ from wax by being more highly oxygenised.

Common *Resin*, usually pronounced Rosin, is a production of the fir-tree. Pure" resin is insoluble in water, either hot or cold; but very soluble in alcohol. Vhen a solution of resin in alcohol is mixed with water, the solution becomes ilky; the resin is deposited by the stronger attraction of the water for alcohol.

By analysis it appears that different resins develope different proportions of the hree elements. Thus,

Common *Resin* is estimated at—	Carbon	75·944
	Oxygen and Hydrogen as in water	15·156
	Hydrogen in excess	8·900
		100

White pure *Copal*, the products are—	Carbon	76·811
	Oxygen and Hydrogen	12·052
	Hydrogen in excess	11·137
		100

There are other resinous substances produced by plants of warm climates, which are highly fragrant, odorous, or fœtid. They are partially soluble in water, and therefore have been termed *Gum-resins*;—the fragrant balsam of tolu; Gum Benzoin, frankincence, ammoniacum, assafœtida, olibanum, rank among these compounds

14. *Camphor.* In noticing this singular substance, we must depart from the authority of Davy, as recent discoveries refer it to the volatile or essential oils.

15. *Fixed Oils*—or, for example, those of the olive, walnut, almond, beech-nut rape-seed, poppy-seed, mustard, sun-flower-seed,—kernels of plum, cacao (calle cocoa)—from the *Theobroma*, the chocolate nut; laurel-berry, &c. &c., are nutritive substances, of great importance, not only in the arts, but in domestic economy and for the preparation of fine soaps. *Olive Oil* has been analysed by the tw French chemists named before, and found to yield of Carbon 77·213: Oxyge 9·427: Hydrogen 13·360.

16. *Volatile, or Essential Oils*, approach to the quality of resins—they evaporate by heat; are soluble in alcohol; which the fat or fixed oils are not;—and ar very slightly soluble in water. A strong and peculiar odour characterises each o them; they inflame very readily, and by combustion afford different proportions o the same elements, namely, water, carbonic acid, and charcoal.

These oils are deposited in cells of the leaves and bark, and may be seen in th leaves of the myrtle tribe, and particularly in those of the cinnamon leaves an bark: this fact presents a strong proof of the immediate connection which exist between the *foliage* and *liber* of trees.

The *essential oils* are of great utility to man. Some are medicinal; such ar the oils of peppermint, spearmint, carraway, cloves, cinnamon, cassia, aniseed. A perfumes, we are indebted entirely to the oils of lavender, orange blossom (*neroli*) lemons, bergamot, and rhodium. Yet, perhaps the most important of the essentia oils is the Oil or Spirit of *Turpentine*, termed also *Camphogen*, or *Camphine* From this material we now possess the means of obtaining a light so pure an brilliant, that imagination can scarcely conceive a thing more beautiful; yet it i attended with considerable danger. Turpentine yields a *dense vapour*, which th chemist Dumas supposes to consist of 500 volumes of carbon vapour, and 800 o hydrogen, condensed into 100 volumes.

Camphor, the product of *Laurus Camphora*, is supposed by Dumas to be a oxide of an hydro-carbon, identical in composition with pure *oil of turpentine* Hence, the addition of oxygen only, is thought necessary to convert turpentine t camphor, and by analysis we find 100 parts of camphor to produce,

According to Dumas—	Carbon	79·28	Or, to Dr. Ure	78·02
	Hydrogen	10·36		11·58
	Oxygen	10·36		10·40

17. *Woody Fibre*, the base of all trees and shrubs; Brande supposed it to be derived from the decomposition of carbonic acid by the energy of the vital principle. Analysis resolves it into about 52 carbon, 42 oxygen, and 6 hydrogen, fractions omitted. Distilled in close vessels it yields a weak or watery acetic acid, and charcoal remains in the retorts.

18. *The true vegetable Acids* which are found to exist in the juices or organs of plants, are the oxalic, citric, tartaric, benzoic, acetic, meconic, malic, gallic, and prussic acid. The oxalic appears to yield no *hydrogen;* from all the others hydrogen is liberated, either alone, or combined with oxygen in the state of water.

We have thus presented a cursory glance of the wonderful products of vegetable organisation; from which it will appear that however multifarious the forms, the elements of so many infinitely varied modifications are very few.

The beauties of floral nature cause delight; the comforts derivable from the stores of the vegetable and fruit garden, are recognised by every one; but it demands the eye and refined feeling of the pious philosopher to discover and appreciate the numberless combinations of attractive energy, which are required to produce those wonderful substances that are treasured up in the vegetable kingdom for the support—the very life—of man, and the animal creature. When we come to investigate the functions of the organism in reference to these products, our admiration will be still more exalted.

PANSIES AS FLOWER-GARDEN PLANTS.

THE fashion of filling the beds of a flower-garden with plants of only one kind, and such as produce flowers of the same colour, is now so completely a part of the modern routine that it is universally adopted. We are not now, therefore, to discuss its merits or advantages, since there must of necessity be a general admission of these, or there would not be such a uniformity of practice.

If we were, indeed, to say anything of the plan in the abstract, we might perhaps have to regret that it is sometimes too rigidly pursued, especially in larger groups, where a greater variety of colour would decidedly improve the effect. One thing, however, is certain, and this is, that where the beds are sufficiently small, and a spreading, dwarf, and showy kind of plant is used, the most brilliant and ornamental results are obtained by this system.

But, as nearly all improvements on old practices involve difficulties in the execution, it is found with this that, while, for late summer and autumnal purposes, a profusion of gay plants may be easily had for filling the beds, it requires extreme familiarity with the habits of hardy herbaceous plants, and attentive preparation, and successive replacement, to keep the flower-garden at all attractive in the spring and earlier summer months.

Bulbs, annuals, and the usual early flowering herbaceous species, are but poor subjects for making up the palpable deficiency, because they can seldom be rendered sufficiently vigorous and dense, on account of the necessity for transplanting them. The frequent removals and the large amount of extra trouble in preparation which such objects require, are also drawbacks to their free employment.

From the constancy of one or two colours in some of the varieties of Pansy, from their lowness of growth, tendency to spread, capacity for blooming early and long, and their extreme showiness, Mr. Edwards, gardener to his grace the Duke of Devonshire, at Chiswick, has selected a few sorts for furnishing the flower-beds, and as we have repeatedly been pleased with their appearance, we think it will be worth while to make the plan public, and explain how and on what particular sorts it is rendered most successful.

In doing this, we shall give the details on which Mr. Edwards has kindly supplied us with information, premising that the leading feature of the system is the abandonment of that promiscuous arrangement of sorts which, however beautiful it may be in itself—and, to our taste, it has greatly the superiority—is not suited for that particular style of grouping which demands that only one or two conspicuous colours be seen in each bed.

In propagating the plants for this object, cuttings are simply put in under a north wall, in a border of light, loamy earth, and the young plants are left in that position till they are required for bedding out in the spring. It is necessary that the situation have a northern aspect, on account of the shade Pansies require during the hotter months of the year. But it is likewise essential that the place be in all respects an open one, and not overshadowed by trees, the drip from which would be most injurious in winter. A corner into which the air would not freely enter, or which is shut in on all sides by trees, would also be undesirable, in consequence of the undue dampness which would be collected in it throughout the winter months. For, although Pansies love a moist place while summer heats prevail, they are very liable to be destroyed by extra moisture, when the sunless days of winter abound.

During propagation, the plants should stand at least a foot from each other every way, that the air may play around them, to keep them hardy and compact. And while they remain in the border where they are reared, care should be taken to nip off the points of the young shoots occasionally, that they may be made sufficiently branchy; and to stir up the ground between the plants, in order to retain them in a good, healthy, growing condition.

As soon as the time arrives for removing them, they must be taken up most carefully, with a scoop-shaped trowel, or small spade, preserving all the soil about their roots which can possibly be induced to adhere to them.

Either the autumn or the spring may be chosen for this transplantation. The latter period seems preferable, since autumn-planted species are rather liable to be disturbed or injured by frosts; while those removed in spring establish themselves more readily and securely. The middle or end of March, or the beginning of April, is the best season for putting them out, according as the openness of the weather may determine.

Previously, however, to Pansies being placed in any bed or border of the flower-garden, such a spot will have to be specially prepared for their reception. To maintain the vigour of these plants, a tolerably rich manure is requisite in the soil, which should, moreover, be a good substantial loam. The most appropriate kind of manure is found to be cow-dung, which, besides keeping the soil cooler and moister in dry weather, contributes, by its porosity, to give additional openness to the earth in a rainy season.

The application of this manure should, by all means, be made in the autumn, or early winter. When the beds are cleared of their summer tenants, a dressing of manure should at once be given, and the ground be well dug over, that it may have time to decompose and pulverise the former, before planting commences in spring.

At the time of planting, allowance is made for the insertion of the summer and autumn occupants of the beds, by putting each plant far enough apart to admit of another being inserted in all the intermediate spaces.

Plants, bedded out in March, begin to bloom almost immediately, and continue in full display till it becomes needful to put in the Verbenas, Petunias, &c., which are intended ultimately to displace them. When these last are introduced, the Pansies are trimmed and dressed, to prevent them from over-running the ground too much; and this dressing is continued with more or less severity, till they are finally destroyed about the beginning of July, or at whatever other period their successors may be fit for filling their places. During all this time, they will be as gay as ever; while they will afford protection to the newly-planted exotics, and give the benefit of that moisture, which their spreading, leafy, and succulent character retains around them.

One principal point to be observed in the introduction of exotics to those beds temporarily occupied by Pansies, is to make the colours of the two classes of objects harmonise as nearly as practicable. Thus, if a blue or a yellow-flowered Pansy has been planted in any one bed, exotics with blue or yellow blossoms are brought in to succeed it; so that, should the exotic begin blooming before the Pansy is removed, the colours of the two may blend, instead of contrasting. The necessary unity is thus maintained.

With respect to all red-flowered exotics, however, they have no counterparts among Pansies; and hence, such things as Verbenas, when placed in a pansy bed, must not be suffered to bloom till they are strong enough to justify the entire destruction of the Pansies.

The varieties which Mr. Edwards finds most suitable for this treatment are not distinguished by any names. They are merely known by the colours of their flowers:—thus, there is a pale, slaty-blue sort, and one with yellow flowers, another with purple, a fourth with whitish blossoms, and so forth. It matters not, in fact, what particular varieties are used, so that they be of a good showy character, and have flowers of one colour, or flowers in which one colour greatly predominates. Sometimes, the existence of two colours in one flower will be an attraction rather than otherwise, as is the case in the two or three-coloured Lupines, Pelargoniums, &c., so frequently seen. Still, the existence of a second colour should mostly be in a milder and softer form.

We should imagine, from the infrequency with which we have noticed the adoption of any practice like the present, that it will be regarded as a valuable plan, especially by the cultivators round the metropolis. The chances of getting a fine display of spring flowers for beds are so doubtful, and the trouble so extreme, that a beautiful and permanent and fragrant thing like the Pansy, will be hailed as a most admirable substitute for the more fugitive objects in general use.

We would not, of course, be understood to recommend that the whole of the beds of a flower-garden should be filled with pansies, even though it might only be for two or three of the first spring months. This would produce a sameness for which no amount of ornament could atone. But, where a well-stocked bed of a plant like this was scattered pretty liberally over the flower-garden, the more imperfectly supplied beds of other objects could be tolerated with far greater readiness. And the better classes of annuals, particularly such kinds as *Nemophila insignis*, nearly suffice to make up the deficiency in variety of form.

DIFFERENT WAYS OF TREATING INDIAN AZALEAS.

THOSE who have seen the glowing and glorious objects which are annually brought to the Chiswick Horticultural Exhibitions, will not be reluctant in acknowledging that the varieties of Indian Azalea are capable of being rendered more truly ornamental than almost any other class of exotic shrubs whatever. The brilliancy of general effect which the specimens so produced occasion, is quite amazing to any one who has only witnessed the plants of this class in obscure country collections. And the exquisite form of the flowers in such varieties as *A. indica lateritia*, *variegata*, &c., gives a most perfect finish to their attractiveness.

But, to the observant eye, it is at once perceptible that the extraordinary beauty manifested at these exhibitions, is mainly due to the adoption of a course of clever management, since the most ordinary, starved, and ragged specimens are sometimes met with.

We purpose, then, describing here a few of the practices which render success so eminent; and more particularly, the several processes by which such a variety of aspect and character is created.

To take the last-mentioned circumstance alone, we might appeal to any attendant at the Shows in question for the verification of our statement, that, in shrubs of such very similar characteristics, a very great dissimilarity of appearance is, nevertheless, obtained, and that this difference is of a most pleasing description.

There are, first, the lovely dwarf bushes, which, while not being higher than nine inches or a foot, spread out into a dense mass of foliage and flowers, and often hang far over the sides of the pots. These are perhaps the most natural and elegant of all the shapes which the Azalea is made to assume. And they are produced by the propagation of the respective varieties from small cuttings, instead of by grafting or inarching on other stocks. The cutting, once struck, is immediately subjected to pruning, the young leading shoot being pinched off to make it produce laterals. This pruning is likewise continued throughout all the early growths of the plant, and is, in fact, the sole peculiar process by which dwarfness is obtained.

Plants thus pruned and stopped soon begin to acquire that individuality of character which makes them so interesting. The pruning must not, however, be confined to a winter dressing back of the mature wood. It should be more especially practised on the young growing shoots during the spring and summer.

The acquirement of compact dwarfness may also be facilitated by pegging down some cf the lowermost shoots, or tying them to small stakes inserted in the soil, or to a ring of wire fastened round the pot, just below the rim. By bending down the shoots in this unnatural direction, the current of their juices will be partially interrupted, and they will be induced to put forth laterals more liberally.

Another system of treating these Azaleas, with a view of conferring diversity, is to convert them into dwarf standards, varying in height from one to three or four feet. Where only a low-stemmed specimen is required, it may be raised from a cutting, and the young side-shoots kept pruned off directly they begin to show themselves, till the stem is strong and tall enough to be capable of developing a sufficient number of laterals. These laterals can also be stopped while they are young, that they, too, may produce numerous side-branches. And after an ample density of head has been obtained, the shoots can be left almost wholly to their own progress, when they will droop slightly, and take a most natural and beautiful figure.

The perfection of a standard, whether it be an *Azalea* or any other plant, is unquestionably in having a sufficiently dense head, while all the outer branches hang and curve about as loosely and gracefully as possible, provided they do not degenerate into absolute wildness.

When, however, a specimen taller than one foot is desired, or when it is required to be peculiarly strong, or is wanted to be reared in a very short time, the best plan of getting it is to graft on stocks of *A. indica phœnicia*. The young grafts can be inserted in the spring, just before they begin to grow, and the plant should be put in a warm shaded house till they are well established. Afterwards, they should be freely cut back, in order to impart bushiness, and otherwise pruned till a proper density of branches is realised.

Either one or several grafts may be inserted on the same stock, at the option of the cultivator; and the scions can be of one or many varieties. We have seen forty different kinds stuck upon the same plant. Although, however, this would occasion a most curious object, one variety will be quite sufficient in point of ornament.

A third mode of giving fresh interest to this tribe of Azaleas, is by training all the branches, whether of a grafted specimen or one on its own roots, to a single face, so as there to concentrate an extraordinary mass of bloom. Intense and dazzling effects are thus produced.

To secure good and satisfactory results, this last process should be commenced while the plant is very young, and the branches supple. All attempts to reduce an old plant to this system must necessarily have a forced appearance. A number of stakes should be put into the soil, along that side of the pot which is to be the intended front, and the tender shoots must be tied to these stakes as soon as ever they will bear it, with their points standing forward. These points, instead of being fastened up the stakes, in the manner of a climber, should be left to push themselves forward; and, when they become too diffuse, a slight pruning will make them protrude a number of blooming laterals.

In these three forms, then, and trifling modifications of each, Azaleas may be made to present a very high degree of splendour. And though we have hardly space to mention what are the essentials to success in the way of culture, we may just mention that an extremely open fibrous soil is the chief of them. Large lumps of heath-mould, filled with old roots and vegetable matter, constitute the best earth for potting them in; and a few small species of sandstone will be a useful ingredient. Immense quantities of soft water while blooming, a gentle heat during the growing period, and the freest current of air and exposure while they are maturing their developments, will complete the routine.

CURSORY REMARKS.

CULTURE OF BURLINGTO'NIA RI'GIDA.

In a tribe of plants so numerous as the Orchidaceæ, comprising species so widely differing in form and character, and above all, inhabiting countries and situations as various as their general appearance, it is natural to expect some that require a treatment peculiarly their own, to bring out their full vegetative powers, although the major part readily adapt themselves to one common routine. And, even though a tolerable degree of success attends the usual practice in the culture of Orchidaceæ generally, and many species even grow with a luxuriance equal to that exhibited in a state of nature; there are yet many which do not adapt themselves to artificial treatment with so much facility, but grow with difficulty, and flower rarely, and far inferior to their native splendour. It has been remarked that this tribe are yet only *grown*, not *cultivated.* The fine specimens exhibited in the neighbourhood of London would seem to give a contradiction to this statement; but, considered in comparison with the excellence attained in the management of other stove and greenhouse plants, there appears to be much truth in it. The present elegant species has baffled the efforts of many cultivators, although appearing to grow freely, and to flower well with others. And, perhaps, the method of management about to be detailed,—though the healthy and clean appearance of the plant evidences its applicability and success, might be dangerous in the hands of the inexperienced. Still it will show that ingenuity, when directed by a knowledge of the habits of a plant and the conditions under which it grows in its native locality, may contrive means to overcome the obstacles and difficulties that arise in adapting it to an artificial climate.

Naturally, *B. rigida* grows during the rainy season in the humid forests of Brazil, sheltered from the blaze of the sun by a thick canopy of foliage; and its peculiar character and the position of its roots, place it beyond the means of acquiring other nourishment than that which floats in the atmosphere or falls from the heavens. From these facts we may reasonably conclude that during the same season in an artificial climate a large amount of aqueous matter is not only necessary but indispensable.

In no place have we seen more healthy specimens than in the nursery of Messrs. Loddiges, of Hackney. The plant is grown in a basket formed of shells, fixed together with wire clasps, and filled with decaying moss, concealed from view by a verdant covering of growing *Lycopodiums.* The looseness of the material and the open nature of the basket, allows water to pass away with great readiness. A trellis formed of four strong, upright wires, with smaller ones twisted spirally around them, supports the plant, which, it will be recollected by those who have seen it, has pseudo-bulbs, distantly separated by long, wiry, ascending rhizomas, and numerous long white roots protruding from the base of each. During the growing season, the plant is placed in a warm house, and near it a pipe, one inch in diameter, from an elevated cistern of tepid water. This pipe is pierced with an extremely small hole, from which a fine *jet-d'eau* rises a little higher than the plant, and beats upon a piece of glass placed over it, which precipitates the water upon it in a fine spreading, dew-like shower, that trickles down the numerous roots, and hangs in pellucid, pearl-like drops at the extremity, undoubtedly furnishing them with an abundance of nutriment, and that more constantly than when dependent for it alone on the atmosphere and occasional syringings.

It is hardly necessary to observe, that this spray-like stream is only applied during the season of the most active growth, and is then accompanied by a proportionately warm temperature; as the bulbs attain perfection, it must be gradually withdrawn, and wholly withheld as the season of torpidity approaches. During winter no more moisture is necessary, or indeed useful, than merely sufficient to maintain the pseudo-bulbs in a plump unshrivelled state. Probably, some similar contrivance to this may be successful with other Orchidaceous plants of difficult management, which grow and flower during the rainy season in their native clime.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR JULY.

Æoˋnium youngiaˋnum. This plant "flowered in June, 1843, in the nursery of Mr. Wm. Young, of Milford, near Godalming, after whom it was named by Mr. Barker Webb, who discovered it in the Canaries. It appears nearly allied to *Æonium* (*sempervivum*) *arboreum*, which, according to Mr. Webb, does not grow in the Canaries." The starry, yellow flowers, are produced in large panicles, very similar to the common House-leek. It has a thick shrubby stem, and shining succulent leaves, with ciliated margins. *Bot. Reg.* 35.

Andro'meda phyllirecefoˋlia. "A very neat greenhouse shrub, introduced lately by Messrs. Loddiges, with whom it flowered for the first time in January last. It was originally discovered in West Florida, at a place called Apalachicola, by the late Mr. Drummond. We place the plant," says Dr. Lindley, "with Sir W. J. Hooker, in *Andromeda,* for these reasons. In the first place, there seems no sufficient grounds for separating them from *Andromeda*, the genera proposed by the Dons, which, to our apprehension, are neither limited by solid characters, nor so contrived as to form useful divisions. Secondly, the plant before us will not suit any of them exactly; so that M. De Candolle, who admitted the proposed divisions, although he thrust it into *Pieris*, a name in which he acknowledges there is no common sense, does so with doubt, and questions whether it may not form a new genus of itself. For ourselves, we cannot separate it from *A. polifòlia.* One of the most striking characters in this very distinct species is, the peculiar darkness of its leaves, which are thus able to set off the snow-white flowers to great advantage. They look like pearls on a negro's neck." It is a dwarf evergreen shrub, scarcely hardy enough to stand the winter in the open air, requiring similar treatment to the other *Andromedas*, and may be propagated by layers. *Bot. Reg.* 36.

Begonia meyerii. "Of this fine species of *Begonia* received from the Berlin Garden, I regret," writes Sir William Hooker, "I know nothing concerning the history; nor of what country it is a native; nor can I find it anywhere described. It is given in 'Steudel's Nomenclator,' ed. 2, as of the Hort. Berol. It flowers during the spring and summer." It is one of the tall-growing species, with strong, upright branching, and almost woody *stems*, and obliquely-ovate leaves of considerable size, waved at the margin, of a pale green hue tinged with red, and having both surfaces covered with a hoary pubescence. The large cluster of handsome white flowers is supported on a long, downy peduncle, also tinged with red, and proceeding from the axils of the leaves. Where the leaves have fallen a large, broad scar, is left on the stem. *Bot. Mag.* 4100.

Ceanoˋthus thyrsifloˋrus. Seeds of this plant were forwarded to the Horticultural Society by R. B. Hinds, Esq., who describes it as being very common, and affording a pleasing appearance about San Francisco and Monterey. "A considerable number of plants have been distributed by the Horticultural Society under the name of *C. divaricatus*, which species it was at first supposed to be. Now, however, that it has flowered, it proves to be *C. thyrsiflorus,* and the first name has to be changed. According to Messrs. Torrey and Gray, this species forms a small tree, with a stem sometimes as thick as a man's arm. The wild specimens gathered at California by Mr. Douglas, for he too found it, appear to belong to a plant of considerable stature, and are completely loaded with dense masses of bloom." A plant against a south wall in the Horticultural Society's garden flowered last May. Any kind of soil suits it, and it is readily increased from cuttings of the half-ripe wood. *Bot. Reg.* 38.

Cala'nthe masuˋca. This species of *Calanthe* flowered in June last year at the nursery of Messrs. Rollisson of Tooting, and again during the present summer. "It is a native of Nepal, and may be regarded as the gayest of the terrestrial species of that country, being conspicuous for the arge size of their flowers and their fine colour. From the other purple species allied to it, it is eadily known by the leaves as well as by the flowers. *C. versicolor* has leaves smooth on both ides. *C. purpurea* downy on both sides, especially beneath ; while this has down only on the nder side. *C. versicolor* has white sepals and petals ; *C. purpurea* and this, purple ones. While, owever, *C. purpurea* agrees in the colour of its flowers, its lip is altogether different, being very arrow, with the lateral lobes quite round." *Bot. Reg.* 37.

Erioste'mon buxifo'lium. An extremely handsome moderately-sized shrub, with leafy green ranches. The leaves are dark-green, of an oval or obovate form, about the same size and a good eal resembling those of the common Box-tree, a similarity which has originated its specific title. t bears "its large showy flowers early in the spring, when so many other Australian plants are n perfection; it deserves a place in every greenhouse." Few plants are more beautiful or esirable than a handsome, well-cultivated specimen of this, when producing its starry flowers—f white and pink exquisitely blended—with its accustomed freedom. *Bot. Mag.* 4101.

Læ'lia pedunculа'ris. This is one of the smaller species of *Lælia,* and is nearly related to *. rubescens* and *L. acuminata.* It is "among the rich collection from Woburn, presented by er Majesty to the Royal Botanic Gardens, and had been sent to Woburn from Guatemala by Mr. kinner. It flowered during the autumn of 1843." It has flattened, egg-shaped pseudo-bulbs, bscurely furrowed near the border, and partially covered with brown scales at the base, bearing single, thick, leathery leaf at the top. The flower-stalks are slender, and vary in length from ight inches to a foot, carrying five or six flowers near the upper extremity of a delicate lilac ose colour, with a deep purple eye in the centre of the lip. *Bot. Mag.* 4099.

Nephe'lium lo'ngan. "One of the many fruits of China which one often reads of, but which s seldom indeed seen in Europe ; yet said to be eaten to a great extent, and ranking with the *N. itchi,* among the best fruits of the Celestial Empire. A fine cluster of this, represented in the ransactions of the Horticultural Society, ripened at Lee Castle, Kidderminster, in 1816. This lant also flowered abundantly in the Edinburgh Botanic Garden in May and June 1841 ; but, hough many fruits formed, they all soon dropped off." It is a tree growing fifteen or twenty feet igh, requiring a stove; the flowers are fragrant, but not showy. It bears globular fruit, which as a smooth yellowish skin, and white, tart, and juicy pulp. The Chinese call it *Long-yen,* or *aong-whan. Bot. Mag.* 4096.

Odontoglo'ssum læ've. "Both Mr. Skinner and Mr. Hartweg found this plant abundantly n Guatemala, and sent it home to their friends, so that it is by no means rare in collections. It s not, however, much esteemed, because of the flatness of colour in its flowers. Nevertheless, they ave cinnamon-brown blotches on the yellow ground of the petals and sepals ; and the lip, which is hite, is banded with violet across the middle ; besides which they are fragrant. The name dontoglossum or Tooth-tongue, has been given to these plants because they are usually furnished ith strong teeth on the lower part of the lip, and these teeth are not unfrequently very conpicuous. Here, however, they are reduced to a couple of trifling notches, and might be easily verlooked. This species should be potted in turfy peat, and placed in a moist stove. A liberal upply of water should be given during the growing season, and the house be slightly shaded in unny weather, in order to keep the temperature as near 80° by day as possible. In winter, like any other bulbous orchidaceous plants, it requires very little water for a few weeks, but would e much benefited (especially in clear weather) if the house in which it is grown could be filled with team once a day. The temperature should at that time never be raised above 60° by fire-heat." *ot. Reg.* 39.

Tropæ'olum lobbia'num. "A very desirable new species of *Indian cress,* which justly bears e name here given to it by one of our most distinguished and liberal cultivators, Mr. Veitch, of e Nursery, Exeter. It was detected by his collector, Mr. Lobb, in Columbia, and sent home in e early part of 1843, and bore its handsome and bright-coloured flowers in November of the ame year. Framed upon those wire trellises, which are now so commonly fixed to garden pots, makes a charming appearance with its delicate leaves, and bright flame-coloured flowers." It s a greenhouse herbaceous plant, with twining stems covered with hair. In fact, every part of e plant partakes of the same hirsute character, except the inner side of the petals and the upper urface of the leaves. The leaves are peltate and obscurely lobed, on very long foot-stalks. *Bot. ag.* 4097.

Umbi'licus malacophy'llus. "A very remarkable succulent plant, native of mountain rocks in Dahuria, and well calculated for cultivation in a dry, stony soil, or upon rock-work. It has been for some years grown in the Royal Botanic Gardens at Kew, in the open border." The leaves are of a broadly obovate form, very thick and fleshy, and of a pleasing green hue, tinged with purple. They are very closely tiled on a short stem. The flowers are disposed in a long cylindrical spike, six inches high, which springs from the summit of the thickly-foliaged stem. Individually, they are uninteresting. The colour is greenish white. *Bot. Mag.* 4098.

NEW OR INTERESTING PLANTS FLOWERING IN THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

Angulo'a. Another new species of this singular genus of Orchidaceous plants has recentl produced blossoms in the stove of S. Rucker, Esq., of Wandsworth. The flowers are muc handsomer than those of the one we noticed two months ago. Instead of the dingy yellowis green hue of that species, the petals are white, or cream-coloured, and bend forward, approachin each other at their points. The lip has a slight tinge of clear pale yellow suffused in it. Th size and form of the flowers is very similar to those of *A. Clowesii,* and, like them, they do no rise very high, but stand singly at the end of a scaly peduncle, issuing from the base of th pseudo-bulbs. The foliage of all the species is very large and handsome. Mr. Rucker wa indebted to Mr. Linden for the possession of this species also.

Codono'psis lu'rida. In the Himalayan range of mountains, the place of rambling Convolvulaceous plants is supplied with this and similar slender trailing species. The flowers are no strikingly handsome, having too much of a green colour to be sufficiently conspicuous amongs the foliage. They are widely bell-shaped, and have a nodding position. As they become older they increase in interest, the lurid spots attaining a more distinct and a brighter character, an the green gradually becoming more pallid, especially towards the bottom of the flower, which eventually, changes to white. The stems are soft-wooded, clothed with neat, heart-shaped leaves and ramble to a great length in the course of a season. Cultivated in a warm greenhouse, the will be appropriately trained round a pillar, or under a rafter, or round a barrel-shaped trellis It has been three or four years in the country, and is flowering in the garden of the Horticultura Society.

Cosma'nthus fimbria'tus. This is a neat little half-hardy annual, with much of the habit an general appearance of a *Nemophila.* The flowers are arranged in a racemose style, and for wide-spreading cups, neatly rounded and fringed at the margin. They have a very pale delicat blue colour, with a white centre. In a sheltered place it will make a pretty bed, but, if expose to strong winds, the stem and leaves turn brown, and have a decayed untidy appearance. It wi be acceptable grown in pots, to flower early in the greenhouse. We saw it at Messrs. Rollisson' Nursery, Tooting.

Cu'phea strigillo'sa. A new species, exhibiting to a remarkable degree the effect of treat ment in the colour of its flowers. Grown in a stove, they are greenish yellow, and comparativel uninteresting; but in the greenhouse, or open air, deepen to a rich vermillion on the mos exposed surface, and gradually sink to yellow on the under side. They are much smaller tha those of *C. Melvillii,* but are copiously produced. Specimens were exhibited at the late show i the Regent's Park Botanic Gardens by Messrs. Pince and Co., of Exeter, and several plants wit much better coloured flowers, are now blooming in the nursery of Mr. Knight, at Chelsea.

Cyrtoce'ros refle'xam. A cream-coloured umbel-flowering plant of the *Asclepias* tribe, wit a climbing habit and an excellent free blooming character, which has obtained the above gener name from the curved nectariferous horns, so prominent in the flower. Even when divested flower, the plant has a decidedly superior appearance, being covered with fine, shining, and som what coriaceous foliage, about the size and shape (excepting the articulation) of those of th common orange tree. It is a tender plant, requiring stove culture, and being unable to suppo itself, should be trained to a rafter or round a barrel-shaped trellis: in either of which situ tions its pretty honey-scented flowers will show to advantage.

Dendro'bium amæ'num. Messrs. Rollisson have lately flowered a specimen of this beautif little plant. Though much smaller in its flowers to many of the specious members of the sam genus, it yet possesses sufficient merit to entitle it to rank amongst plants of interest. There is ovely softness in the blending of the colours of its flowers that cannot fail to attract notice. The rincipal hue is a soft blush, deepening towards the extremities of the flower into a rich purple. he base of the lip wraps round the column, and the expanded portion is much curled and unduted, and has a considerably broader space of purple colouring than the sepals and petals. The owers issue from slender naked stems rising about six inches, two or three blossoms springing rom each of the uppermost nodular rings.

Epide'ndrum caloche'ilum. A plant from the Kew Botanic Gardens was exhibited, in legent Street, in the beginning of last month. There is a great similarity in the most obtrusive haracters to *E. altissimum.* The inflorescence consists of large loose panicles of dingy bronze owers, with narrow sepals and petals, and a frilled lip, having a bright yellow margin, and overed with rough irregular raised plates of violet purple.

———— **radia'tum.** An intermediate species between *E. fragrans* and *E. cochleatum*, aving the size and streaked lip of the former, and the rounded petals of the latter. The colour s also intermediate. The leaves are rather longer and narrower than those of *E. fragrans*, and e pseudo-bulbs smaller. It is blooming in Messrs. Loddiges' collection.

OPERATIONS FOR AUGUST.

Notwithstanding the unfavourable and almost unprecedented long continuance of drought iroughout the months of April, May, and June, when under more propitious auspices the most ixuriant growths are usually made, the majority of greenhouse and half-hardy border plants hich have been turned out to contribute towards the autumnal decoration of the flower-garden, ave now covered the ground, *en masse*, with shoots, and foliage, and flowers. This is in fact e season when there is the least difficulty in rendering the pleasure-ground showy with gay and eautiful colours, Ere long, however, all these will feel the untoward effects of pinching frost, nd be deflowered of all that now renders them so fascinating.

The certainty of the speedy termination of present and still increasing beauty, ought, then, to e a spur to the industry, ingenuity, and vigilant care of the cultivator to remove everything ffensive, and make it all the eye can desire, whilst it yet remains. Every new shoot should be arefully tended, and guided into the most advantageous position ; every shoot that interferes ith the proper display of its neighbour should be removed, as well as all those that extend eyond their prescribed limits, or betray a flowerless luxuriance, and rob the more modeate and fruitful of their wonted share of support. But pruning and training must never e so far extended, or so untastefully executed, as to induce a stiff and formal habit. Ease nd elegance is ever looked for amongst plants grown expressly for decorative purposes, nd, indeed, constitutes the principal attraction of many species; and though a fantastical orm, or a whimsical design, may look curious, they soon cease to interest, and the eye everts with increased pleasure to those permitted to retain sufficient of their natural abit to avoid the harshness of formality. With border-plants, where the object is solely o cover the ground and form a gaily-chequered carpet, the shoots should still be pegged own when they rise too high, and the form and outline of the bed should be preserved in as ell-defined a condition as possible, by spreading the shoots equally over all the surface, hinning out where too rank, and cutting back when they extend beyond the marked outline. he latter, moreover, must not be executed in the untasteful hedge-like manner sometimes seen, f clipping every shoot, when it reaches the edge of the border, with a pair of garden-shears ; ut each straggler shortened separately, so as to leave the extremities of other shoots beyond the ound to conceal it, and destroy all obtrusive evidence of the means employed. By removing ll flowers and flower-stalks stript of their beauty, the colour of those that have succeeded will how to greater advantage, the plants will look more neat and clean, and it will, further, be ecidedly beneficial to the health, and promote the continuance of the flowering, of the plant. he advantage of removing decaying flowers is especially exhibited in the Rose, the petals of hich, when the flowers are not gathered before they fall, strew the ground around, effecting a nost unsightly and slovenly appearance ; and they are then much more difficult to remove than the precaution recommended had been employed. Consequently, *economy of labour*, as well as *ncreased neatness*, is best studied by a timely resort to this practice.

In promiscuously-planted herbaceous borders, many species will have ceased to flower for the season. These should have their stems cut down, unless they still retain a healthy green hue, and have an ornamental habit, when the flowers and their peduncles alone may be removed, observing, as before directed with other plants, that this is managed so as to avoid a stiff and unnatural appearance. If the stems are cut down, other plants, such as annuals in pots, ready to burst into flower, should be planted beside them, so as to occupy their place in maintaining beauty. Where tall plants are required to fill up the opening thus created, *Sweet Peas* in flower, which have been grown in small pots, to confine their roots, and kept in a rather shaded place, will be a most suitable substitute, as they will continue to bloom for the remainder of the season. And these plants are usually more attractive when not turned out of the pots till they begin to flower, than when planted out young, and allowed to grow the whole season in borders.

Many of the early-sown annuals will require to be removed, and their places supplied with others ready to flower. The beauty of many, such as *Eschscholtzia, Iberis, Erysimum, Eutoca,* &c., may be prolonged, when planted or sown in beds, by continually pinching back a few of the flowering shoots. This will induce the formation of lateral branches, to flower at a later period, without creating any visible diminution of present show. The same remark will apply with equal propriety to many varieties of China and other Roses, which, by successively removing some of the flowering heads, and cutting back those that have shed their blossoms, may be continued in an abundant and uniform blooming state, as long as there is sufficient warmth to develope them.

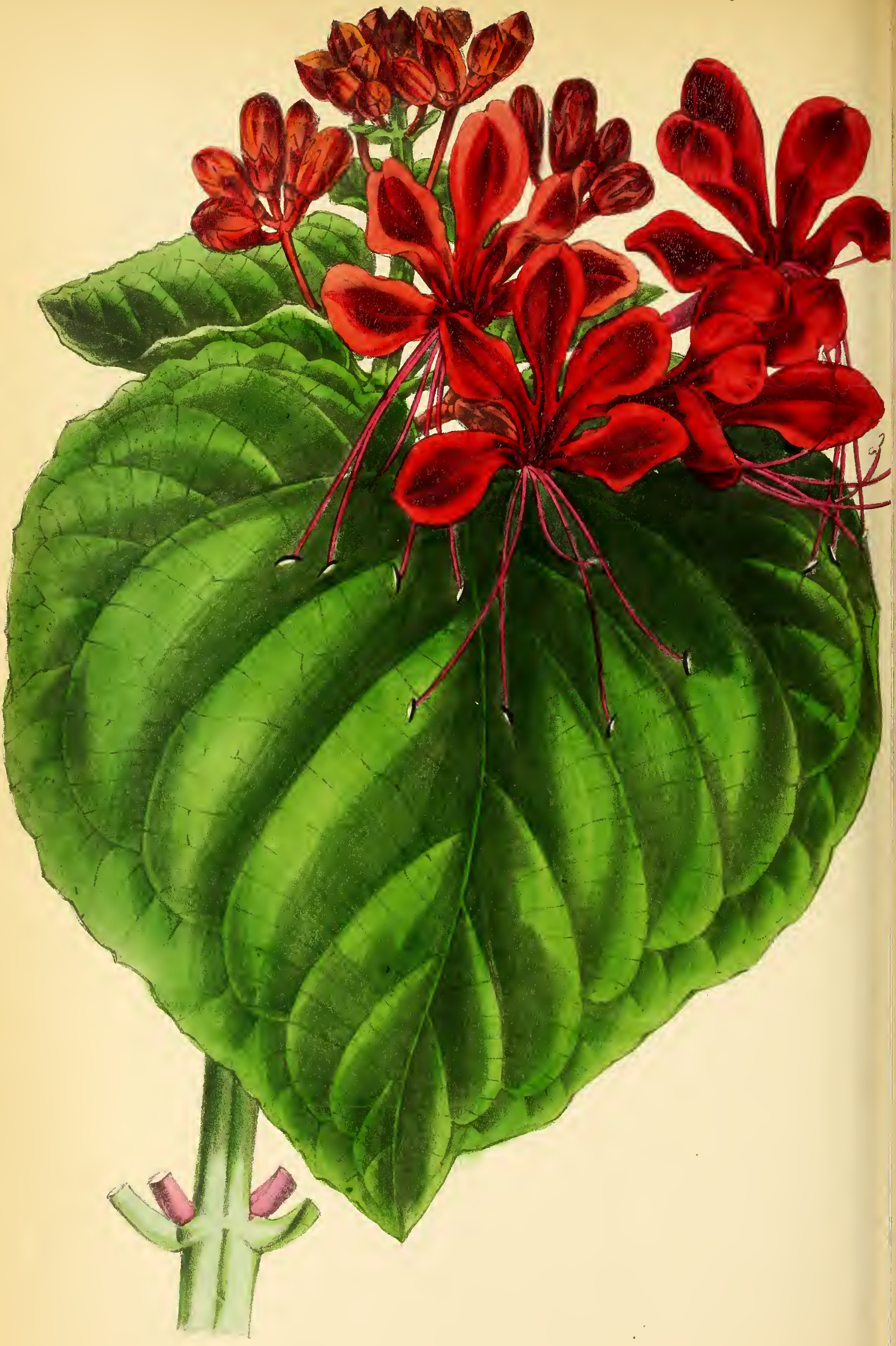
But although flowers may be well cultivated and borders kept tidy, but a very indifferent effect will be produced unless all other parts are made to correspond. The unclipt edging of a lawn, or a gravel-walk filled with weeds, or covered with moss, will detract greatly from the appearance effected by the most skilful management and elaborate neatness amongst the gayer features. No opportunity must be left unimproved, that can minister towards attaining the most perfect propriety in all these points.

If the propagation of border-plants has not already commenced, set about it immediately, in order that the young plants may be better established, and the risk of losing them during winter diminished. Those who have not frames at liberty may strike many of the plants commonly used for border purposes, in a bed prepared in the garden, shaded from the sun, and protected from rain and wind, by a canvass covering stretched out on a skeleton, formed of strong lathes, and placed over them with a slight inclination to the north. *Verbenas, Petunias, Salvias, Cinerarias* and *Calceolarias,* and many hardy plants, less frequently cultivated though scarcely less deserving may be successfully increased in this way. The cuttings may either be inserted in the bed in fine sand, or very sandy soil, or in pots and boxes filled with the same material. If the former method be adopted, they must be shifted into pots as soon as they have made roots. The remova of cuttings will be beneficial to the plants, in causing the production of two or three additiona shoots, each bearing as much bloom as that abstracted would have produced had it been allowed to remain. And it will be of still further advantage to shrubby plants in making them mor bushy, and preventing the lower portion of the shoots from becoming naked.

The atmosphere of the greenhouse must now be maintained in a less moist condition than ha been recommended for previous months, as the object must now be rather to promote th maturity of the wood already formed, than to seek for a further increase, that the plants may b less susceptible of injury from sudden depressions of temperature, and require a smaller expen diture of fuel throughout the winter. To aid in this object, the doors and ventilators may b more freely opened than at an earlier season, and the plants less constantly shaded, and graduall inured to bear more and more light. This must be done carefully, that the health of the plant may not be injured.

These observations will extend also to the Orchidaceæ-house and stove, though in a somewha modified degree. In the Orchidaceæ-house, especially, any alteration in shading must be chiefl confined to damp and cloudy weather, for the majority of these plants are by nature formed t grow only in umbrageous forests, and, consequently, are unable to endure full exposure. When there is the conveniency of two houses, those species that have completed their growth may b removed to the cooler house, and kept in a drier state.

Plants against conservative walls need frequent tendance to tie in the growing shoots, an remove all that are not wanted, or that would interfere with the proper exposure of others.



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Clerodendron infortunatum

CLERODÉNDRUM INFORTUNÀTUM.

(Unfortunate Clerodendrum.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
VERBENÀCEÆ.

Generic Character.—*Calyx* campanulate, five-rted, five-toothed. *Corolla* with a cylindrical tube, en elongated; limb five-parted, lobes equal. *Stamens* ur, didynamous, exserted, secund. *Germen* four-lled, one-seeded. *Stigma* bifid, acute.

Specific Character.—*Plant* an evergreen shrub. *m* erect, quadrangular, slightly furrowed. *Leaves* large, somewhat roundly and deeply cordate, broadly toothed at the margin, upper surface pilose, under surface tomentose. *Panicle* coloured, pubescent. *Flowers* racemose and nearly sessile in heads at the end of the panicle branches. *Calyx* large, five-cleft. *Corolla* segments smooth, obovate, obtuse, a little shorter than the stamens.

Almost every Floral Exhibition in the neighbourhood of the Metropolis brings gether a number of remarkably well cultivated specimens of that showy and tensely bright scarlet-flowering stove plant, the *Clerodendrum squamatum*, and a naller-blossomed closely allied species often confounded with it, and therefore oposed by Dr. Lindley to be named *C. fallax*. The gorgeous aspect of these lendid plants cannot fail to have fixed the attention of every one who has been rtunate enough to see them; and it is, therefore, with the greatest pleasure that e are enabled to offer another, in many respects even more beautiful and desirable.

The singular specific name is by no means calculated to convey a favourable ea to those who are unacquainted with its origin, and the character of the plant hich bears it. To prevent the spread of unfavourable impressions regarding it, it ay be useful to state, that it was applied in contradistinction to another species eful for its medicinal virtues, and on that account called *C. fortunatum*, Linnæus. The same reason will account for another, alike dangerous as a bstitute for its more favoured ally, being named *C. calamitosum*.

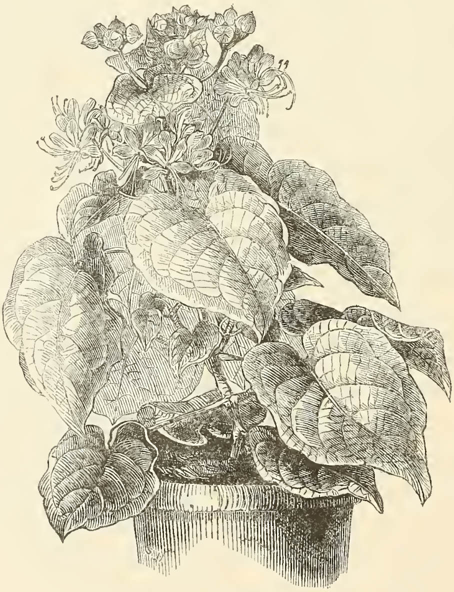
According to the account given of *C. infortunatum* in the "Botanical Register" Dr. Lindley, it was first received from Ceylon into the collection of the Duke Northumberland at Sion House in 1843, through the instrumentality of r. Nightingale. Our drawing was taken from a plant which flowered in the ursery of Mr. Glendinning at Chiswick, and which was exhibited and obtained e Large Silver Medal at the Horticultural Society's Show on the 15th of June.

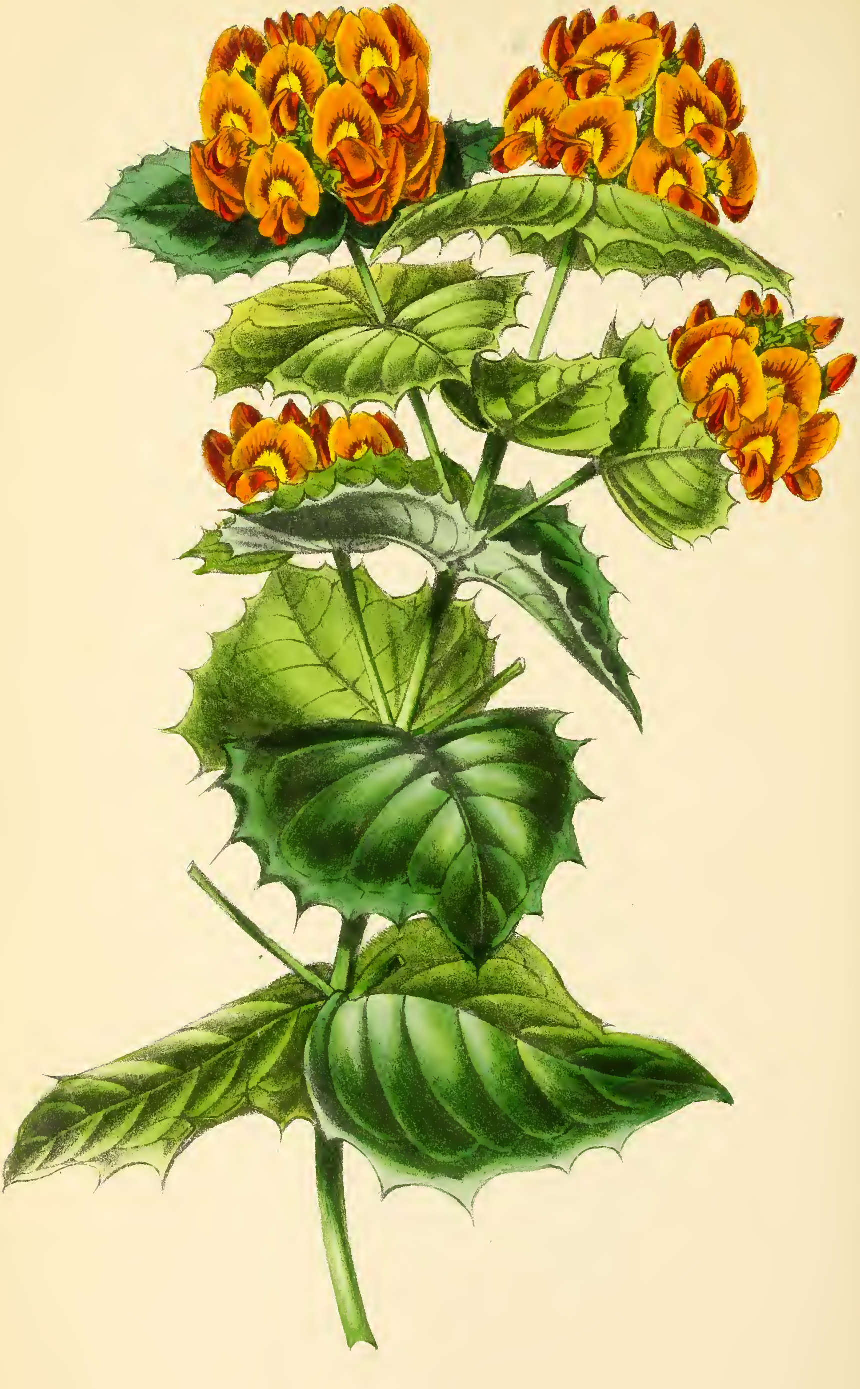
A decidedly preferable feature in its peculiarities to other species is the qualit of blooming in a much dwarfer state. Several specimens not a foot high have bee flowered by Mr. Glendinning, and it is in this condition, with its noble foliag hanging upon the very edge and almost concealing the pot that holds it, that it superiority is most conspicuous; and it will hence be a plant admitting of much more extended culture than other kinds, which, from their large size and th room they occupy, are unfitted for limited collections.

But independent of this advantage, the individual attractiveness of its blossom is a weighty recommendation. The flowers are larger and superior in the dept and vivid glow of colour. It is also distinguished by its coloured panicle and larg leafy calyx, the flowers being collected into heads and having very short pedicel (footstalks), and lastly, in the glossy hue of its ample dark-green foliage.

It is a plant of rapid growth, readily increased from cuttings, which soon strik root planted in heath soil and sand. A moist stove-heat, with abundance of wate and a powerfully nutritious soil, are necessary to maintain the vigorous characte of the species.

Linnæus founded the name of this genus, as well as those of several of i members, on the variable medicinal properties with which different species a gifted. It is compounded of two Greek words—*Cleros*, hazard, and *dendro* a tree.





W. Dickes, del & lith

Gastrolobium spinosum.

GASTROLÒBIUM SPINOSUM.

(Spinous-leaved Gastrolobium.)

Class.
DECANDRIA.

Order.
MONOGYNIA.

Natural Order.
LEGUMINOSÆ.

Generic Character. — *Calyx* five-cleft, bilabiate, bractless. *Petals* about equal in length. *Ovary* two-seeded, pedicellate. *Style* subulate. *Stigma* simple. *Legume* ventricose. *Seeds* strophiolate.—*Don's Gard. and Bot.*

Specific Character. — *Plant* an evergreen shrub. *Leaves* nearly sessile, opposite, smooth, very broadly heart-shaped, with six equidistant spinous teeth at the margin on each side, and a terminal one. *Flowers* in clusters at the extremity of each shoot. *Corolla* with an orange-yellow vexillum, and reddish-purple wings.

Of all the plants of this tribe that we are acquainted with, few admit of being more easily reduced to handsome proportions, or have a habit and foliage so neat and unique as this. With a degree of strength and robustness unusual amongst the leguminous plants now abounding in such plentiful variety in our greenhouses, it combines broad and conspicuous leaves, so markedly different in their outline to every other of the same class within the sphere of our knowledge, that whilst they attract notice by their novelty, neatness, and amplitude, they at the same time furnish a distinction so prominently perceptible, that the most cursory observer can never be at a loss to distinguish the plant from those that most nearly resemble it.

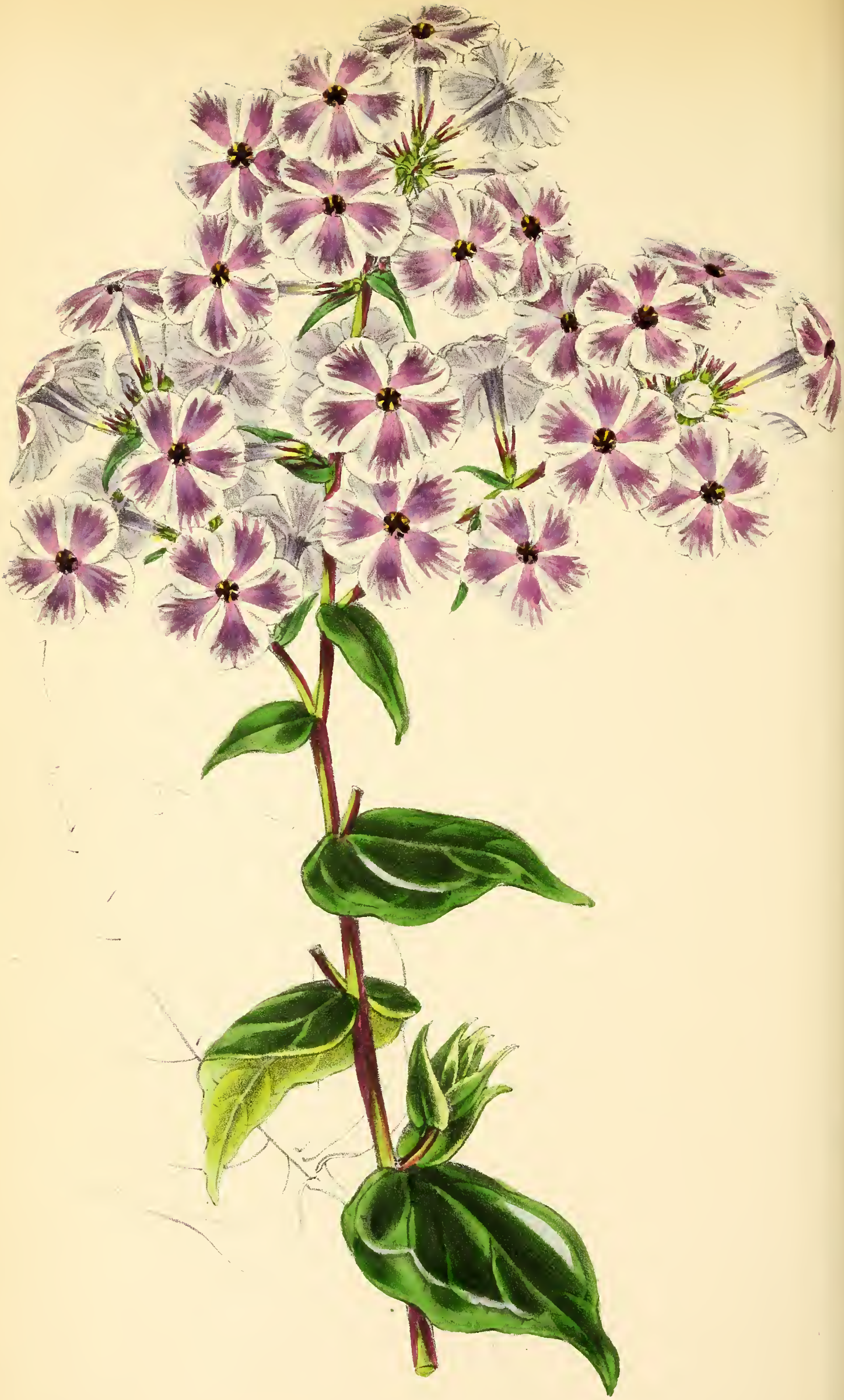
Till the development of flowers in the spring of the present year afforded the chance of referring it with certainty to its proper station, it was cultivated and generally known as *Chorozéma oppositifòlia*, a mistake which most probably arose from the analogy displayed in its general features to those of the stronger-growing and larger-foliaged species of that genus. However this may be, there can now no longer be a doubt of its incorrectness, and the consequent necessity of abrogating it.

Seeds were imported from the Swan River colony and distributed by Capt. Mangles a few years since; and Mr. Young, of the Epsom Nursery, was fortunate enough to raise a number of specimens which have since been multiplied by cuttings, and distributed amongst the principal metropolitan establishments.

From the original plant, which flowered profusely with Mr Young for the first time last March, we were courteously permitted to make the annexed representation.

Although flowers have never been disclosed before the present year, the prodigality of their production, in every case we have witnessed, justify us in considering it as a free-flowering and highly ornamental species. At Ealing Park, Mr. Robertson had a number of small plants just raised from cuttings, completely laden with blossoms. These had been kept in a warm house; and we have no doubt that the flowering, and indeed the health and vigorous growth of most New Holland plants, will always be vastly improved by the application of a little additional warmth in the early spring months when the shoots are tender.

The name of the genus is a combination of two Greek words *gaster*, the belly, and *lobos*, a pod, alluding to the distension of the legume. The marginal spines of the leaf have suggested the specific term.



S. Holden del & Lith

Phlox Van Hootii

VAN HOUTTE'S PHLOX.

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
POLEMONIACEÆ.

A GARDEN VARIETY.

Phloxes may with propriety be registered with the most showy and valuable of hardy herbaceous plants, for the magnitude and density of their panicles of prettily-rounded and lively-coloured blossoms give a most attractive and gay appearance to the borders during the flowering season. Of late years many beautiful additions have been made to the varieties in cultivation by hybridizing; and almost every shade of colour now exists, from pure white to a fine crimson purple.

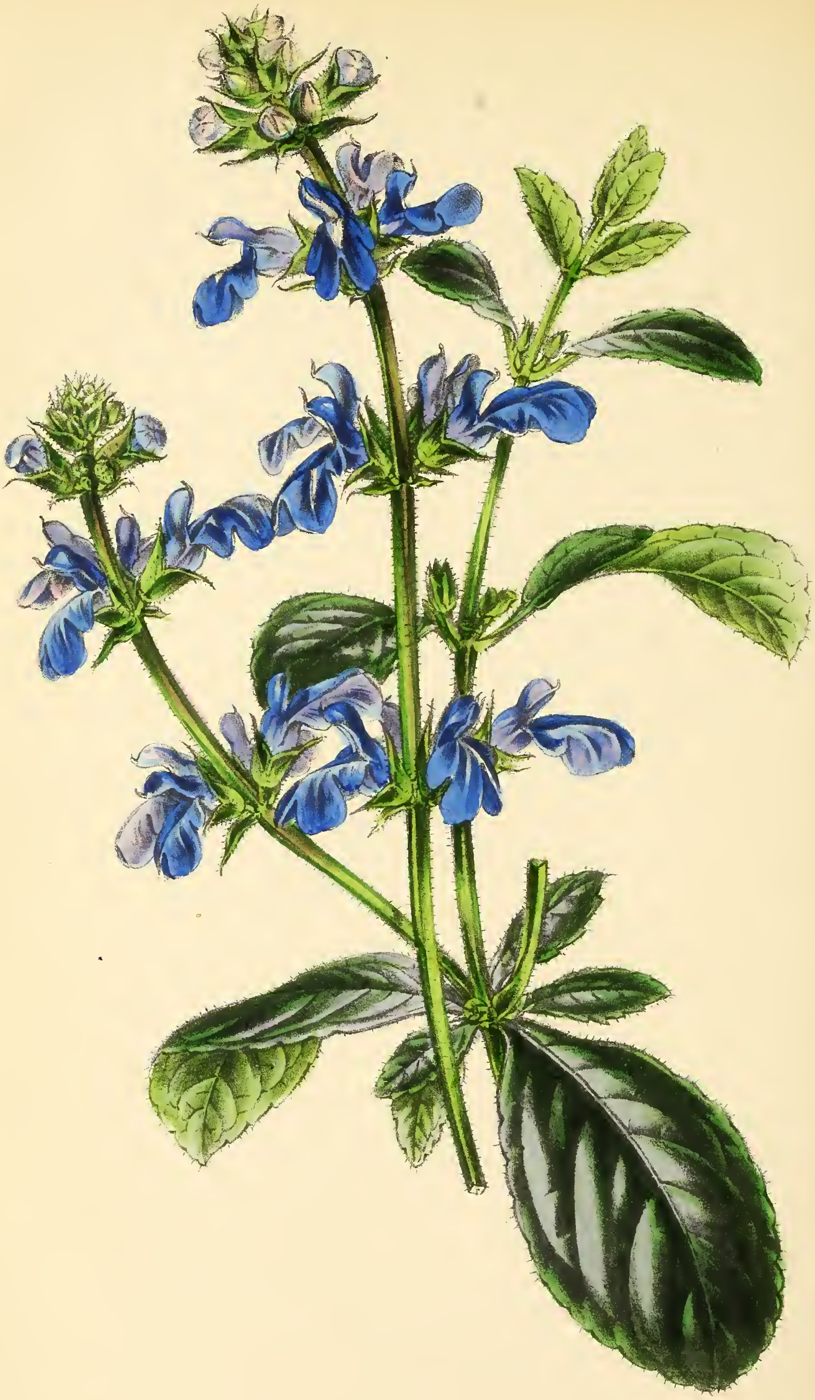
The variety before us has evidently originated in this way, by intermixing one with pale flowers, with a dark-coloured one; and as it bears a close resemblance to *P. suffruticosa* in its smooth, lanceolate, shining leaves, and dappled stem, and also in the arrangement of the inflorescence, it is more than probable that that species has been one of the parents. The other has doubtless been some of the taller-growing kinds, as *Van Houttii* usually reaches a yard in height. The chief peculiarity, as will be seen from the drawing, is the rich purple streak down the centre of each petal.

The metropolitan nurseries and gardens contain several varieties of a like character, indicating the same origin, by the similarity in their leaves and foliage, which can scarcely be said to differ. One of these, called *Princess Marien*, has also a purple stripe down the middle of the petals, but the colour is inferior to *Van Houttii*, and the rim of white at the margin is much narrower. Another variety, known by the name of *Alcardii* has bright crimson-purple flowers with irregular streaks of white, and is a more beautiful and showy flower than the last. *P. bicolor*, a seedling raised by Mr. Mountjoy of Ealing, is also an interesting variation, the eye of the flower being bright rosy purple, and the remainder white, or a very pale blush.

In common with other Phloxes, these only require a moderately rich soil to produce vigorous specimens, and they admit of being extensively increased by cuttings of the young growing shoots, inserted in sand, and placed in a pit or frame with a very trifling bottom-heat. Plants may also be obtained by division of the roots.

Planted rather closely in large beds on a lawn, and the shoots bent down, as soon as it can be done without danger of snapping them asunder, and pegged to the ground with hooked sticks, they speedily cover the entire surface, and when the ends have regained an upright position and expand their flowers, they have an imposing appearance. There is, moreover, an additional advantage in pursuing this treatment; for the recumbent posture of the stem encourages the formation of lateral shoots, which flower successively, and lengthen the period of the attraction, as well as increase the density of the mass. Much of the beauty of such a bed, however, depends on the regular distribution of the shoots over the surface. If permitted to grow upright, in the usual way, the central shoot should be topped to induce them to become bushy, or several plants put in together.

The present variety was obtained by the London Nurserymen last year from M. Van Houtte, of Ghent, but whether it originated with him or not, is unknown. A fine specimen which flowered in the herbaceous ground in Messrs. Henderson's Nursery at Pine-apple Place, furnished us with the opportunity of supplying our readers with a representation.



S. Holden Del. & Lith.

Salvia prunelloides.

SÁLVIA PRUNELLOÌDES.

(Prunella-like Sage.)

Class.
DECANDRIA.

Order.
MONOGYNIA.

Natural Order.
LABIÀTÆ.

GENERIC CHARACTER.—*Calyx* tubular, ribbed, unequally two-lipped, permanent. *Corolla* tube dilated upwards, compressed; upper lip concave; lower lip broad, three-lobed, the middle lobe largest, cloven. *Stamens* with two divaricated branches, one only bearing a perfect, oblong, single-celled anther. *Germen* four-cleft. *Style* curved with the stamens, usually longer. *Stigma* forked. *Seeds* four, oval, in the bottom of the dry converging calyx.—*Don's Gard. and Botany.*

SPECIFIC CHARACTER.—*Stems* herbaceous, nearly simple, erect, pilosely pubescent. *Leaves* petiolate, ovate-oblong, obtuse, crenated, narrowed at the base, green on both surfaces, and nearly glabrous; floral leaves ovate, acuminated, deciduous. *Racemes* simple, on long peduncles. *Whorls* remote, sub-secund; upper whorls approximate, ten-flowered. *Calyx* campanulate, striated, clothed with silky hairs, having the upper lip shortly tridentate, and the teeth of the lower lip lanceolate, acute. *Corolla* about three times longer than the calyx, pubescent outside; tube ventricose, equalling the calyx; middle lobe of the lower lip emarginate. *Style* bearded.

OF the many *Salvias* described in botanical works, there is decidedly a preponderance of species with flowers of a cerulean tint. Some of these now hold a deservedly eminent station amongst the summer-garden decorations, and we are glad to be enabled to give prominence to another, which, although it has been known in Nurseries since 1840, is rarely seen beyond their precincts.

The comparative obscurity in which it has been fated to continue, may perhaps be traced to the introduction about the same time of the more showy *Salvia patens*, the magnitude and superior loveliness of the flowers of that species having completely engrossed the attention of cultivators in the desire so universally manifested to possess it, to the almost entire exclusion of all less-favoured competitors.

In its habit of growth *S. prunelloides* is unexceptionable. The stems are produced closely, without appearing crowded, and rarely grow more than a few inches high, when planted in a border. The foliage is of that happy medium size, which has neither the coarseness of some of the larger-growing species, nor yet the scantiness of many of the smaller kinds. The plant spreads by means of underground stems, which develop shoots with great rapidity that soon acquire a flower-bearing maturity; and though the blossoms, individually, are rather minute, yet, when a number of flower-stems (rarely more than eight or ten inches long) are borne in close proximity, they produce an effect decidedly ornamental.

For some time, it was a matter of doubt whether it would endure the severity of our climate without protection during winter. We are, however, enabled to state its perfect hardiness, plants having stood without the slightest protection for three successive winters, in the Nursery of Mr. Bunney, at Stratford. It ought to be planted in a well-drained and airy situation; and, unless the soil is tolerably nutritive, the flowers will be much inferior in size. A hardy plant, with bright-blue flowers, to contrast with Verbenas, &c., in the parterre, must be useful.

We believe the merit of raising and flowering the first plants in this country, is due to Mr. Moyes, of Durdham Down Nursery, Bristol, who received roots from Mexico. Humboldt and Bonpland met with it on the volcanic mountain of Jorullo, where it grows in rocky situations: it has also been found in New Spain, by Mocino and Lesse, and in various parts of Mexico, by different individuals.

Our figure was prepared from a specimen which bloomed in August, 1843, in the Nursery of Mr. Knight, at Chelsea.

GARDENING AS A SCIENCE.

VEGETABLE PHYSIOLOGY.—No. VIII.

FUNCTIONS OF THE LEAVES. In the Article No. VII. some idea was conveyed of the products of vegetable organization, leading to the inevitable inference that, animals entirely, and the human species to a very great extent, are indebted for their chief sustenance, and many of their essential comforts, to those multiform products.

The uses of analysis are very great. We are not among those who attach implicit credence to all the theories of the Chemist, because it is impossible to bring the vital functions to the test of his re-agents. A plant, living and growing—its roots fixed to, and wandering within their appropriate bed of earth; and its superior developments revelling in the atmosphere of heaven,—is not, nor can ever be rendered the legitimate subject of chemical investigation. It is the office of the laboratory to rend to pieces, and to destroy; to extinguish life, while in search of the elements of its products; therefore, every experiment with cuttings, detached portions, or even with entire plants raised from the soil, is an unnatural process; one which either destroys life, or investigates its offices under altered conditions. But when the Chemist operates upon gums, resins, sugar, or the fabric of woody tissue, his course is legitimate, and he then correctly arrives at those conclusions, which it was the object of our last article to point out.

Presuming, therefore, that without exception, every known vegetable product is resolvable into the elements carbon, oxygen, and hydrogen, with or without nitrogen; we may safely search for causes, or first principles, and inquire whence, and through what mechanism, a plant has derived the substances which, by any possibility, can furnish those ultimate elements.

The Atmosphere consists of four-fifths of the air or gas called *Azote* or *Nitrogen*, and one-fifth of the gas called oxygen in round numbers;—these are its indispensable components.

The two gases, so united, constitute breathing or respirable air; but with them floating in the volume are uncertain portions of other gases—carbonic acid, hydrogen, watery vapour, and a trace of ammonia, which affect the quality and salubrity of the air.

Water, in the state of a liquid, is said to be composed of hydrogen and oxygen—two volumes of the former to one of the latter, held together (according to Dr. Faraday) by a quantity of electricity, so vast, as to startle and confound the imagination. Water, however, as such, like similar compounds, is not oxygen and hydrogen. By the action of the voltaic battery, it is made to *yield* those gases; and, *vice versâ*, the elements so developed can, by the electric spark, and by other processes of combustion, be re-united in the form of water. Such processes of decomposition and re-union furnish the most conclusive and beautiful evidences of chemical accuracy; but they by no means elucidate causes. In order, therefore, to obtain a glimpse of *these*, we ought to consider the law of electric induction, which teaches that whenever any electrized body approaches another body, it induces or excites an opposite, or different electric condition therein; and that these conditions produce mutual attraction. *Oxygen* and *hydrogen* gases are thus in different electric conditions, and they are disposed to unite together suddenly and with violence, or progressively and without explosion; in either case watery vapour is the product. This undoubted fact leads to the inference that oxygen and hydrogen are vehicles of two distinct electricities, or that they are themselves *electrics*, ever tending to unite, and producing by their union multifarious phenomena which we term meteorological.

Carbon (vulgo, charcoal) is found in the woody fibre of vegetables—and as a residuum of the combustion of vegetable substances. According to Liebig, an atmosphere of carbonic acid pervades the soil wherein *humus*, or decaying vegetable matter is present.

Carbonic acid is produced by the union of carbon vapour and oxygen gas; it is the result either of active or slow combustion, and is a product of electro-chemical attraction.

Nitrogen exists in the atmosphere; it is also a component of ammonia, of nitrous acid, and of most animal, and many vegetable, bodies.

We thus have before our eyes the chief elements of all the plants with which we are acquainted—other substances, as salts, alkalies, and earths, are traceable in the ashes of plants, and occasionally in their juices; but these being derivable from the earth in a state of watery solution, and varying according to local circumstances, we may set aside, as not affecting the present inquiry.

Assuming, then, the hypothesis (which, till positively refuted, we consider as more than probable) that every chemical phenomenon in nature, every act of union and decomposition, is induced by the electrising agency of the sun, we obtain four agents, which we term elements, that are ever present in the air, water, and earth; and ready to combine under the influence of electricity, as exerted by the vegetable vital principle.

Connecting these facts with the structure of the *organism* (Liebig's expressive word), we perceive that each instrument, each portion of the mechanism, is perfect. We find in the roots and stems a variety of tissues, vascular and cellular, appropriate to the absorption and deposition of the fluids derived from the soil; and, in the structure of the *foliage*, tissues similar in character, connected with orifices, or oscular pores, (*stomata*,) by and through which, the gases of the atmosphere, and those developed in the plant, can pass interchangeably; and, finally, by the analysis of all the products, we are enabled to conjecture that the elements of all these products are derived from the earth and air.

It is an axiom in philosophy, that nothing ever can be lost, or extinguished. A change of form and condition is for ever in progress; plants derive their rudimental existence from seeds, their future causes of increase from the earth and air, till they attain a state of maturity; and, during that period, they furnish sustenance to the animal creation. To maturity succeeds decay, which is nothing else than a slow, protracted combustion, whereby the *carbon* and *oxygen* are excited to attract each other, and to combine in the form of *carbonic acid gas*; the *hydrogen* and *nitrogen* to take the form of *gaseous ammonia*; and the *hydrogen* and *oxygen* that of *watery* vapour. These and other gaseous products pass off, and float in the atmosphere, while the residuary solid carbon remains fixed in the condition of black humus, which, in its turn, becomes further changed by the conjoint operation of the soil, and the roots of plants growing in it.

That plants absorb and respire by the stomates of the leaves, is probable; at all events, they expire water or watery vapour, as is shown by the water deposited upon leaves, by other leaves reposing upon them; but in all artificial experiments, the results are never to be relied on. Liebig has justly remarked, that "the mere observation of a wood or meadow is infinitely better to decide so simple a question than all the trivial experiments under a glass globe; the only difference is, that, instead of one plant, there are thousands. When we are acquainted with the nature of a single inch of soil, and know the composition of the air, and rain-water, we are in possession of all the conditions necessary to their life. The source of the different elements entering into the composition of plants cannot possibly escape us, if we know in what form they take up their nourishment, and compare its composition with that of its vegetable substances which compose their structure."

An *Oak*, produced from an acorn in water, is still growing in that water, occasionally replenished, in which it first germinated two years ago; every fibre is covered with water algæ; and whenever the sun shines fully upon these parasites, transparent bubbles of air detach themselves, and rise through the water. Here then is an evidence of decomposition, not in the oak, but in the green vegetable matter which covers its roots; this tribe requires no sensible carbon; it will exist in water, and may liberate either a portion of the oxygen of the absorbed water, or of that from the small quantity of carbonic acid emitted by the roots of the oak, and taken up by the water-plant. It is very instructive to observe these minutiæ, which take place daily, but are passed by without reflection.

OBSERVATIONS ON THE TREATMENT OF A FEW SPECIES OF LUPINES.

Unjust and very inaccurate estimates are frequently made of the desirability of a plant, or tribe of plants, from the specimen which first brings us acquainted with them being indifferently grown, or exhibiting itself under circumstances of disadvantage, from a mistaken idea of its character, or ignorance and negligence in providing it with the situation most appropriate to it.

With some plants, this carelessness and indifference in management produces little deterioration in beauty, as they readily develop themselves independent of the culturist, and are scarcely improved by his most assiduous attentions; others, however, when neglected, are little more than weeds, and yet assume an ornamental character of no mean pretensions, when favoured with suitable management.

Amongst Lupines, we find species of both these classes. The old *L. polyphyllus*, so universally known and extensively diffused throughout the country, even amongst the gardens of cottagers, where it frequently forms one of the gayest and most alluring ornaments, requires little attention to induce it to assume its utmost degree of loveliness; indeed, the full force of the cultivator's skill makes little impression upon it. The same remark will apply with equal propriety to *L. grandifolius*, and several other similar species, all of which, planted in a common garden soil, need little further attention; and the only way in which their effect can be improved is in the arrangement—when they are considered as a feature of an extensive design, and not as an abstracted object.

With *L. mutabilis*, *Cruickshankii*, and some others, the case is different. These species need some peculiarities in their treatment, especially in the early part of the season; but as they are seldom seen invested with the loveliness and luxuriance of which they are capable, they rarely excite much solicitude regarding them. Most of the specimens seen in gardens consist of a single stem, weak and crooked, usually not more than a foot or eighteen inches high, and rarely adorned with more than one or two puny spikes of blossom.

When rightly treated, however, they form trees six or seven feet high, with beautiful branching heads of the most complete symmetry, beset with numerous spikes of various-coloured flowers, in which a light blue preponderates, peeping from amongst the many-cleft leaves, and forming conspicuous and engaging objects, especially if favourable situations are selected for exhibiting their elegant proportions.

Much of the pleasing effects of plants depends on their tasteful and judicious arrangement. Our object in the present remarks, therefore, will be to point out some of the most eligible methods of disposing the different species, and to subjoin a few observations on their culture.

The greater part of the genus, which consists of the herbaceous and annual species, in most cases produce the best effect when planted in masses, either of single species, or of two or three mingled together. In the latter case, only those species should be aggregated that harmonize well together, exhibiting no harsh contrast in form of growth, or unmeaning irregularity in the different heights they individually attain. A group planted in an open conspicuous part of an extensive rockwork, or on the sides of a rough uneven bank, has a beautiful appearance. Broad patches, planted at distant intervals on the edge of a shrubbery, skirting a lawn, have also an enlivening and attractive effect.

The lower-growing annual species, such as *L. luteus* and *L. nanus*, from their prostrate habit, and the prominence and neatness of their flowers, are admirably fitted for planting in beds of moderate size in the flower-garden. The green leaves form an ample covering for the soil, and set off to great advantage the intrinsic showiness of the flower. By pinching off the ends of a few of the longest shoots from time to time, and shortening back those that assume a tendency to grow upright and rise above the rest, a regular and more plentiful succession of bloom will be produced throughout the season.

For the sake of diversity, some of the larger-growing species may also be planted in more extensive beds on a lawn, and in such situations have a pretty appearance, when not too profusely introduced. In beds thus planted, a row of the more diminutive species on the margin will help to conceal the nakedness of the lower part of the flower-stalks towards the close of the season, and also assist in giving a higher appearance to the centre of the bed.

For *L. mutabilis*, and similar species, which, though ordinarily treated as hardy or half-hardy annuals, are really greenhouse shrubs, and may be preserved from year to year, and propagated from cuttings with as much facility as a Pelargonium, a somewhat different mode will be more appropriate. Their altitude and luxuriant growth fit them rather for standing alone, as isolated specimens on a lawn, or occasionally intermingled, though with caution, amongst other and less succulent shrubs, to fill up a vacant place. They always, however, succeed best in a situation as free as possible from surrounding plants, where they have room to spread their rapidly-forming branches on every hand.

When kept low, and induced to form a large-spreading bushy head, by frequently stopping the young growing shoots, they are very eligible plants for filling vases during the summer season; and where there is a deficiency of hard-wooded ornamental plants for this purpose, the short time required to produce handsome flowering specimens of these renders them more useful. They should not, however, be placed in elevated situations, where they will be exposed to the action of violent winds, as the softness and weight of the shoots renders them highly susceptible of injury.

It is evident that something beyond the common plan of sowing seeds in the open ground, or even in slight hot-beds, and transplanting at once to the destined situation, must be employed to obtain large specimens at a tolerably early season. The best plan is to sow seeds in pots, placed in a gentle bottom heat, about the beginning of March, and as a few days only are necessary to their vegetation, young plants will soon be ready for transplanting singly into small pots; and as these become filled with roots, remove them into others three or four sizes larger. If short specimens are required, either for the lawn or for vases, as soon as they have again taken root and begun to grow freely, they may be removed from the frame to the greenhouse, or to a close frame without bottom-heat: but if tall plants are more desirable, it will be better to place them in a working vinery or in the stove. In the latter situation they will grow long, and perhaps rather weak; but if properly secured to stakes, and gradually inured to a cooler temperature before they are planted in their final situation, this will be no disadvantage, as they will speedily strengthen, and always retain their superior height over those grown in the greenhouse.

Where a great show of bloom is indispensable in the greenhouse during winter, bushy specimens of *L. mutabilis* and *L. arborea*, three or four feet high, will be found useful, and especially in large establishments, where room is a less formidable objection. Grown in pots sunk in a garden border till the middle of September, and then repotted and removed to the greenhouse, they will continue to flower till after Christmas, and probably, with careful attendance, till the return of spring.

EARLY BLOOMING PLANTS FOR FLOWER-BEDS.

While lately writing on the desirableness of using Pansies for filling the beds of a flower-garden in spring, we had occasion to observe that, if the same colours were sought to be preserved in each bed throughout an entire season, Pansies alone would not suffice for the purpose, as there is an utter absence of all shades of red in their blossoms.

Since that time, we have been in communication with Mr. Edmonds, who furnished the chief part of our former details on the subject, and we now add a few additional particulars, which we have been enabled to glean; convinced that all information on so popular a point must at once be esteemed.

The main thing to be looked after in getting objects for flower-garden display, is, to secure those flowers which do not fade rapidly, and of which there is a tolerably lengthened succession on the same plant. This is what renders those half-hardy and semi-shrubby plants, that are so greatly admired during summer and autumn, of such extreme value to the culturist. And on the existence of this property, in a greater or less degree, (combined, of course, with a generally ornamental character,) the usefulness of a flower-garden plant may immediately be decided. It is possessed, to a very unusual extent, by Pansies; and the plants now to be named are by no means deficient therein.

Mr. Edmonds tells us that he has supplied the want of a scarlet colour amongst Pansies in his spring garden, with *Turban Ranunculuses* and *single-flowering Anemones*. The latter he raises from seed, and allows to flower in the seed-bed, when he selects all those with scarlet flowers, and destroys the remainder. If sown in a tolerably rich soil, and not too thick, so that the leaves may spread and be fully exposed, a large supply of roots may soon be obtained, of sufficient strength for the flower-garden. The beds intended to be occupied by them, are prepared as early in autumn as circumstances will permit, with a good manuring of cow-dung, and, if necessary, a little fresh loam is added; for, by continually producing two crops every season, it would otherwise soon be exhausted. The earlier the roots can be put in, the earlier and stronger they will flower.

When it is time to plant out the Verbenas, or scarlet Pelargoniums, &c., the Anemones and Ranunculuses are carefully taken, with as much earth about them as will adhere, and laid in the earth in a vacant part of the kitchen-garden, where they can be shaded for a fortnight or three weeks (if the weather prove dry and sunny) to mature their tubers. As soon as the stems are withered, the roots are taken up, dried, and put carefully by in paper bags, in the usual way.

In taking them up Mr. E. finds it most important to preserve the leaves entire; for if they are carelessly bruised or broken off, the roots, instead of ripening, speedily begin to shrivel; and if they should happen to grow another year, the production of flowers would be scanty and diminutive. We examined two or three bags of tubers treated in this way, and they appear as plump and well-matured as any that have been allowed to remain undisturbed.

The Verbenas and Pelargoniums, &c., intended to fill the beds in summer, should have larger pots and be kept growing, exposing them gradually to the air; and as the season advances, merely protecting with a mat or canvass during the night. The Anemones and Ranunculuses need not be removed till the last of the Pansies are cleared away; consequently the Verbenas and Pelargoniums will have made good plants, and soon fill the beds and flower.

It is advisable that a little foresight should be exercised, so that those beds which are soonest cleared in the autumn may be planted with the Anemones and Ranunculuses without interfering with other arrangements, or bringing too many beds of one colour together. Those plants which will be wanted for the green-house in winter, or to be taken up in autumn and preserved in frames, should if possible be in those beds suitable for planting with Anemones and Ranunculuses.

A few beds of these plants would be instrumental in relieving the monotony of Pansies; and whilst they contribute to enliven the spring garden, would not interfere with its autumnal appearance.

There is one circumstance relative to flower-garden plants in general, which we may take this opportunity of strongly insisting upon; and this is the necessity, as already suggested, of freely manuring or altogether renewing the soil in the beds about every other season, or even every winter. The frequent changing of crops on the same earth must inevitably rob it of a considerable portion of its nutritive properties. And such abstraction is increased by the spreading luxuriance which many of the varieties attain.

The old notion that manure is unfavourable to the development of flowers has been before combated by us. It is one of those dogmas which modern practice has completely annihilated. At least it is now clear that a moderate manuring is of immense benefit to great numbers of flowering plants. And as flower-garden ornaments are required to accomplish an abundant growth in a short time, theory assumes that they must be peculiarly advantaged by manure, and experience fully supports the assumption.

We therefore again strenuously advise that both manure and fresh soil be liberally furnished to the flower-beds, wherever the appearance of the old earth, or the nature of the plants to be next cultivated upon it, will at all justify the application.

FLORICULTURAL ŒCONOMICS.

Many persons of liberal dispositions, who shrink from the very mention of the word economy, are yet greatly influenced in their respect for a gardener by the magnitude of his yearly financial accounts, and esteem him all the better if these are kept moderate. Hence the importance to a gardener of studying well both the principles and details of real economy.

Others, however,—and these constitute by far the larger class,—are pleased with any scheme, and ready to follow any advice, which is recommended on the score of economy; and thus an additional and stronger necessity is pressed upon the gardener to give his strictest attention to this subject. A man who can bring about the same results at a considerably less expense, is unquestionably best calculated to work himself into a respectable position.

We offer these remarks here, because we wish, in again turning to this question, to bring it more prominently before the gardening profession. Where a gardener is persevering, and possesses a tolerable share of shrewdness and tact, he may do a great deal with small means at his command; and while an achievement of this character entitles him to all the more merit, it should be remembered that, instead of inducing a spirit of parsimoniousness in his employer, it is likely to yield results of a directly contrary nature: for where a gentleman sees an individual accomplishing great things with little resources, he is almost necessarily inclined to give him greater encouragement.

Probably in none of the minor departments of floriculture is there more money needlessly expended than in procuring soil for composts. The heath-mould, especially, which enters so largely into the composts used for most potted plants, and also into the earth prepared for some tribes of hardy shrubs, is commonly obtained from a great distance, and often has to be paid for in addition to the expense of cartage. Much of the heath-mould used in some places is of that description which is easily reduced to a finely pulverized state, when, being itself partly composed of sand, and having a good portion of the same mixed with it artificially, it becomes positively unfit for maintaining any plant with a moderate share of foliage. We are acquainted with a nursery celebrated for the healthiness and beauty of the young heaths which are sent out from it; but the older specimens seldom maintain ny degree of health in it, and the young stock that is sold rarely succeeds in ther places. The reason of this we believe to be, that a finely-reduced heath-soil and sand are employed for potting, and get so thoroughly consolidated, hat the roots can never develop themselves freely.

Recent improvements in cultivation, with respect to soils, have discarded heath-mould in a great variety of instances, and retained it only when it can be broken up into pieces of from one to two inches diameter, and is full of fibrous vegetable matter. As a common ingredient in composts for exotic plants generally, its use is of very doubtful propriety. Its value is also much overrated in the culture of uch plants as Rhododendrons in the open air, as some of the best specimens of his class which we have ever seen have been grown in a loamy soil.

In truth, almost the sole advantage to be gained by employing heath-mould in he majority of cases is due to its mechanical texture, and not to any peculiar roperties which it contains. It is mostly composed in part of vegetable fibre, nd is therefore very porous. It usually comprises, moreover, a quantity of sand, nd the popular belief has, till very lately, adjudged sand to be an excellent constituent in composts. But now that sand, as an addition to compost, is beginning o be discarded, and sandy heath-soil is considered to be the very worst variety of is class, it is clear that other things might be substituted which would answer the esired end much more perfectly, even in a mechanical point of view.

Since, then, it can be made to appear that heath-soil may be dispensed with n a multitude of cases without serious inconvenience or injury, it becomes an mportant economical question how its place can be supplied when its cost amounts o a large sum per load.

For mechanical objects, a very good substitute for heath-soil is fresh, fibrous, pen loam, mixed with a small proportion of broken sand-stone instead of sand. This will maintain a more permeable texture than heath-mould, and will not be so kely to consolidate.

But a still better soil than loam,—as a mechanical agent,—and one that will urther give the character of vegetable remains which belongs to heath-soil, is that btained from decayed leaves. This kind of earth will supply all the peculiar haracteristics of heath-mould, with more of its porousness, considerably greater utritious power, and a far less liability to get soddened or compressed into a solid mass.

Other matters which are serviceable for mingling with loam and leaf-mould so s to complete their fitness for using in the place of heath-soil, are wood-ashes, owdered or finely broken charcoal, mouldering fragments of decayed wood, and he thoroughly decomposed residue of any vegetable substances which may have een casually collected.

All these things are, indeed, of the greatest usefulness, and as every possessor f a garden may easily prepare them, they should never be neglected. Wood-ashes form a most appropriate nutriment for plants, however delicate they may be;

and they are likewise valuable for improving the texture of soils by keeping them porous. Charcoal is similarly efficacious, and for precisely the same purposes; while, the more it is broken and reduced towards a state of powder, the more readily will it accomplish what is required. The crumbling remains of decayed wood are of a like nature, and calculated to be equally beneficial. Nor is any kind of decomposed vegetable refuse a jot the less desirable, provided it be free from the seeds of troublesome weeds, and the eggs or larvæ of insects.

A mixture, however, of three or all of these things,—including always the turfy loam, the leaf-mould, and either of the others indifferently,—will give the best approximation to the character of heath-soil; which last, after all, is not to be assumed unfit for use, when it can be cheaply procured, and of a good quality; but which should by no means be purchased at an extravagant price while it can be dispensed with in this manner, especially if it be of an inferior description. The compost we have spoken of, is infinitely preferable to *bad* heath-soil.

Yet, although the practice of buying heath-mould at an extravagant cost is of the commonest occurrence, some cultivators are in the habit of paying large prices for loam of a particular nature. We have known from thirty to forty shillings paid for a cart-load of loam; when a loam of a greatly more suitable character might have been obtained from the pastures of the estate to which it was brought.

The chief requisites in loam that is to be employed for potting plants in are an open texture, a freshness and richness in salts such as an old undisturbed meadow will furnish, and the mixture throughout of a tolerable quantity of the roots of those vegetables or grasses which have been growing upon it. Almost every place will yield a greater or less quantity of loam such as this; and to go to any distance for loam of a stronger nature is as needless as it is extravagant.

What we would say, then, to the cottager, the amateur, or the gardener, who pays a high rate for his heath-mould or his loam, or who refrains from growing certain plants because he cannot get either, is to urge him to the exercise of his skill in mixing and preparing the soils he actually possesses, and to substitute these for the others. If all the vegetable refuse of a garden were collected, and all the small rubbish of wood, and all the fallen leaves, and these decayed in separate heaps, and turned over now and then during the process of decomposition, a store of most excellent soils would soon be obtained; and, mixed with common garden earth of a mellowed and moderately rich nature, the wants of the most varied tribes of plants might thus be met.

On no account, however, should any sand be put amongst the compost; nor should a small proportion of broken stone or bricks ever be omitted. Soft sandstone is the best where it can be had, and it should vary in quantity with the strength of the plant to be potted. Thus, a delicate plant, with fine and minute roots will want a larger proportion; and a strong robust specimen will require only a very trifling quantity.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR AUGUST.

Ae'rides vi'rens. "This is a beautiful addition to that set of *Aerides* of which *A. odoratum* vas the first discovered. Like the flowers of that species, these are deliciously and very peculiarly cented, and not at all inferior in size. Each sepal and petal has a deep purple blotch at the end, vhilst the remainder is a delicate soft French white. The lip is speckled with crimson, and bears n the middle an inflated, sanguine, serrated tongue." Messrs. Loddiges imported this species rom Java, and a specimen flowered in one of their orchidaceous houses in April, 1843. All the pecies known resemble each other closely in habit, and have similar strap-shaped leaves, bliquely notched at the end. The peculiar brightness of the green in the leaves of *A. virens* as suggested the specific name. *Bot. Reg.* 41.

Ascle'pias ve'stita. Mr. Veitch, of Exeter, raised this plant from seeds received from the outhern states of North America, and flowered it in the greenhouse last October. It is a well-narked species, and distinguished from all others "by the thick and very hairy stems and eduncles, by the peculiar form of the cuculli or leaflets of the staminal crown, and by the bsence of the horn-like processes so common within the cucullis in other species of the genus." The flowers are rather large, of a yellowish green colour, and are collected into a dense hemi-pherical umbel at the end of an axillary peduncle, about the same length as the sessile elliptical eaves. *Bot. Mag.* 4106.

Be'rberis umbella'ta. "This is a hardy sub-evergreen shrub, about three feet high, growing reely in the common garden-soil, flowering abundantly in June, and easily increased either by eeds or layers. It was raised in the garden of the Horticultural Society, from seeds received rom the East India Company at different times, and under various names, but more particularly hose of *B. Wallichiana* and *B. floribunda.* It is no doubt in many other collections, under this r similar names. *B. floribunda,* however, has spiny leaves, not at all glaucous on the under ide; and *B. Wallichiana,* which also differs in those respects, has sessile fascicles of flowers, nd is quite another thing. This is easily known by its narrow, spineless leaves, slightly glaucous eneath when fresh, and becoming more so when dry." "As for the name *umbellata,* it is unfortunate that it has been introduced into systematic works, for the shortness of the racemes, rom which circumstance it has been taken, is apparently accidental and unimportant." *Bot. Reg.* 44.

Drya'ndra formo'sa. "Mr. Brown detected this noble and handsome species of *Dryandra* n Lewin's Land, on the south shores of Australia, growing in sterile places, and deemed it worthy of a figure from the pencil of Mr. Bauer, which was published in the 'Linnæan Trans-ctions.'" The plant in Kew Gardens "is a tree about fourteen feet high, raised from seeds ent home by Mr. Baxter from south-west Australia; and, during the spring and summer months, is richly studded by the orange-yellow flowers arising from the copious short branches, nd backed by the dark-green foliage, which spreads in a stellated manner all around them." *Bot. Mag.* 4102.

Habrotha'mnus e'legans. "The beauty of *Habrothamnus fasciculatus* is so striking, that ttention is strongly drawn to the discovery of other species in Mexico; and the Belgians have lready succeeded in adding the present, which, although not comparable with *H. fasciculatus,* is evidently a graceful and gay-looking plant." "It differs from *H. fasciculatus* in its small bracts and less conspicuous flowers, which, moreover, are smooth, not downy; from *H. tomentosa* in the shortness of the lobes of the corolla, and the broadness of the leaves, the smoothness of the calyx, and the terminal, not lateral, flowers; from *H. corymbosa* in not being destitute of hairs." Specimens flowered with M. Van Houtte, Nurseryman, Ghent, in January last, but it does not ppear to have been yet received into the collections of this country; being evidently a quick-growing, soft-wooded species, it will require the same treatment usually given to Pelargoniums. The flowers are understood to be bright carmine. *Bot. Reg.* 43.

Microsty'lis histiona'ntha. This singular terrestrial species of Orchidaceæ was purchased at a sale of Columbian plants in 1842, and flowered in the stove of the Regent's Park Botanic Gardens, in November last. "It is remarkable in the curious structure of the flowers, and in these numerous flowers all meeting together, nearly at the same level, so as to form a slightly concave even surface, with the blossoms very compactly arranged, but especially in the centre whilst yet in the bud." The flowers are of a dingy brownish-green colour, and by no means showy. *Bot. Mag.* 4103.

ODONTOGLOSSUM PULCHELLUM. "A most delicate and elegant plant, well deserving the name Mr. Bateman has appropriated to it. It is a native of Guatemala, introduced through the medium of Mr. Skinner." The pseudo-bulbs are oblong, and clustered, surmounted by two long linear leaves, which vary in length on different pseudo-bulbs. The flower-scape proceeds from the base of the pseudo-bulbs, and is usually something longer than the leaves. The flowers are arranged in a loose raceme, and, with the exception of the anthers and the crest of the lip, which are yellow, the latter spotted with red, they are pure white. *Bot. Mag.* 4104.

SIPHOCA'MPYLUS LANTANIFO'LIUS. Sir William J. Hooker has figured a plant which he considers as a variety of this species, as described by De Candolle, from specimens collected in Caracas by M. Vargas. It was sent to him from Liège, by Mr. MacKoy, and only differs from De Candolle's description in the very indistinct pubescence found on the shoots, leaves, and calyx. It is an upright, rather weak-growing shrub, branching freely, and clothed with foliage very similar to the other species. The most prominent distinguishing feature is in the arrangement of the inflorescence, the flowers being numerous, and disposed in a corymbose raceme. The size of its purple corolla is intermediate between *S. bicolor* and *S. betulæfolius*, approaching that of the latter. The flowers are produced early in spring, and cuttings take root readily. It will be a desirable acquisition to the stove. *Bot. Mag.* 4105.

STENOME'SSON HARTWE'GII. "A pretty little bulbous plant, found by Mr. Hartweg at the Hacienda del Ixo, on the ascent to Antisana, in the province of Quito, at the height of 11,800 feet above the sea." It has gay orange-coloured nodding flowers, growing in pairs "at the summit of a scape a foot long." It flowered in the garden of the Horticultural Society last March, and it has also appeared in other collections, having been extensively distributed by the Society. It thrives well in the usual admixture of peat, loam, and sand, with abundance of water, in the early part of the season, gradually reduced in quantity after the flowers are expanded, and wholly withdrawn towards autumn, when the bulbs should be kept perfectly dry till they show signs of renewed vegetation. During the growing state, a frame is most suitable, and whilst in flower they may be removed to a greenhouse. Several bulbs should be planted in a pot, to create any show. *Bot. Reg.* 42.

NEW OR INTERESTING PLANTS RECENTLY IN FLOWER IN THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

ACHIME'NES PI'CTA. Most cultivators are acquainted with the splendid species of *Achimenes*, which now usually occupy so prominent a position in greenhouses and stoves, and at floral exhibitions in the summer season. Another species has been introduced, and recently distributed by the Horticultural Society of London, which, though inferior to some of the species so well known in the size and abundance of its blossoms, is extremely attractive in the peculiar markings of its foliage. It has stout hairy stems, which do not appear to grow more than a foot or eighteen inches high, well covered with handsome broadly-cordate leaves, very soft and velvety, with an irregular glaucous blotch in the middle, running out on the lateral veins, and margined with a dark olive-green colour; the whole surface, both upper and under, is also beset with numerous long soft hairs. Even when destitute of flowers, if the plant be in a healthy growing state, the zebra-like markings of the foliage give them a very pleasing appearance. The flowers greatly resemble those of *A. pedunculata*, and fully rival the brightness and glowing richness of the blossoms of that species. They issue from the axilla of the leaves, and stand prominently clear of the foliage, on long, single-flowered peduncles: the form is tubular, gradually widening towards the limb, which spreads flat, and is divided into well-rounded and compactly-fitting segments, the lower part yellow, with numerous spots and interrupted lines of crimson, and the upper half scarlet-crimson, with much darker spots. Two or three pretty specimens flowered, a short time back, at the Nursery of Mr. Glendinning, of Turnham Green; and another, well-grown, but hardly come to perfection of flowering, was exhibited in the Horticultural Rooms, Regent Street, at the last meeting, from the gardens of the Society. It will probably be an excellent variety for hybridising. A mule, combining the large attractive flowers of *A. longiflora* or *A. grandiflora* with the ample and pleasingly-variegated foliage of *A. picta*, would be an acquisition well worth attempting. Plants may be obtained at most of the metropolitan nurseries.

ANGRÆ'CUM ARMENI'ACUM. This species has much to interest those who are curious in examining the more minute members of the vegetable kingdom, though, from the diminutive size of the flowers, it is not a very conspicuous object. It is a caulescent species, with long thick roots, and linear leaves obliquely emarginate at the apex, and standing out on opposite sides of the stem, on which they are alternately fixed, sheathing each other at the base. The flowers are arranged on short spikes, springing from the axil of almost every leaf, down to the foot of the stem; the sepals, petals, and lip are coloured with fine bright, shining orange-yellow, and being all nearly of the same length, and similarly pointed at the extremity, have a pretty cupped star-like character. Attached to the lip is a long yellowish spur, fully twice the length of the petals, and contracted near the junction with the spur. Messrs. Loddiges received plants of it from Sierra Leone in 1839, and we noticed specimens flowering amongst the extensive collection grown at their Nursery, Hackney, in the early part of August. It is most interesting when attached to a block of wood, with a little moss about it, and suspended from a pillar or the roof.

CHELO'NE MEXICA'NUM. A tall and handsome species, approximating in character and general form to *C. barbatum* and *C. centranthifolium*, but essentially distinct from both. The flowers are of a brighter and deeper scarlet, and something larger than either of the species alluded to. There are a few long scattered hairs on the lower lip, at the throat of the tube, whilst, in the flowers of *C. barbatum*, the beard is more dense, and those of the other species are altogether destitute of hairs. Both these species also differ from the present in the form of the leaves. It has been in the country about two years, and is sufficiently hardy to stand the winter without protection in a dry border. Fine plants have been flowering in the Nursery of Messrs. Henderson, at Pine-apple Place, for the last three months. It grows four or five feet high, the whole, with the exception of about a foot or eighteen inches at bottom, being set round with flowers.

COMPARE'TTIA FALCA'TA. Those who are acquainted with *C. rosea* will know the scantiness of its roots, the natural debility of its growth, and the consequent difficulty of managing it, so as to obtain flowers. Combined with all the elegance for which that lovely species is so eminent, the present has a much more luxuriant habit. The leaves are broader, larger, and more numerous, a sure consequence of the greater abundance of strong healthy roots. It has long drooping racemes of thinly-scattered elegant flowers of a rich rosy purple colour, the lip reticulated, with veins of a slightly deeper shade. The resemblance of the species to *C. rosea* is so close, that it might easily be mistaken for a well-cultivated specimen. It should be carefully attached to a small block of wood, the roots protected with a thin layer of moss. Too much heat seems to be inimical to the success of plants of this genus. In Messrs. Loddiges' Nursery, where we observed a beautiful specimen of *C. falcata* in flower two or three weeks ago, they are kept in a cool house along with *Cattleyas*, &c. As an ornament to the drawing-room, few plants are more interesting. It was introduced by Messrs. Loddiges, from the Riv. Polochic, in 1842.

DENDRO'BIUM SE'CUNDUM, VAR.—In August 1843, the Horticultural Society received several specimens of a variety of *D. secundum* from their collector, Mr. Fortune, who met with it shortly after his first arrival in China. One of these specimens is now flowering in the Society's collection at Chiswick. The flowers are borne in racemes issuing from the nodular rings near the top of the stem, and are very closely aggregated, all the flowers turning to the upper side of the raceme. From the original species, received from Sumatra, it differs in the intensely rich rosy purple shade of the flowers. Though not so gaudy as some of the splendid large-flowering species, it is a very neat and interesting species, and does not require so much heat as some of them.

EPIDE'NDRUM.—A splendid species, decidedly one of the finest and most graceful of its class, has recently expanded flowers of a delicate and beautiful pink hue, in the collection of Messrs. Loddiges, at Hackney. It is one of the pseudo-bulbous groups, with two or three thick leathery leaves, and a flower-stalk, issuing from among them. The scape is brownish purple, with numerous whitish warty excrescences spread over its surface ; it grows about eighteen inches high, bearing along the upper portion a number of large flowers with long, lanceolate, acute, sepals, and petals of a slighly dissimilar form, tapering more towards the base ; both are widely spread. The lip is divided into three lobes ; the lateral ones are small, and recline on the column, a little reflexed at the extremity ; the middle lobe is very large and expansive, deep purple in the centre, and becoming paler towards the margin, and prettily streaked with purple lines in the way of *E. phœniceum.* The plants thrive well, and the flowers always last much longer in a cool house.

Erioste′mon sca`brum. Under this name we have lately observed a handsome new greenhouse species, in the nursery of Messrs. Henderson, of Pine Apple Place, who received it from the gardens of Baron Hugel, at Vienna, about twelve months back. In habit it much resembles the other species ; but has narrow linear leaves, which, though they exhibit the starry pale pink flowers more freely, are wanting in that pleasing breadth of green, which is so engaging in *E. buxifolium*, even when without flowers. To obtain good, bushy, spreading specimens, it will be necessary to stop the growing shoots frequently when the plants are young, and to promote their vigour by a tolerably large pot filled with a compost of peat and loam. The soil will be the more appropriate for being pretty open and fibrous.

Franci′scea pohlia′na. We first observed this species in the nursery of Mr. Low, of Clapton, and have recently seen specimens flowering with Messrs. Henderson, of Pine Apple Place, and in the exotic nursery of Mr. Knight, of Chelsea. We believe it was introduced to England through the continental nurseries. It is a small, upright, branching plant with purplish stems, and elliptic lance-shaped foliage, clothed with short downy hairs on both surfaces. The flowers are produced in a loose head at the end of each shoot, are equal in size to those of *F. uniflora*, but have a little more of a violet tinge. A stove-heat appears to be necessary to keep it in a healthy state.

Ixo`ra acumina`ta. This is a stove plant of considerable beauty, with handsome bright green leaves, frequently above a foot long. Although not so gaudy as the *I. coccinea*, the large showy masses of flower which push from the ends of the lateral shoots, are very interesting. Plants eighteen inches, or two feet high, flower well in a stove-heat. The flowers are deliciously fragrant.

Nola`na. Last year Mr. Best, gardener to Alexander Park, Esq., of Merton Grove, succeeded in raising plants from Chilian seeds of a shrubby species of *Nolana*, and has several specimens in flower at the present time. The stem grows erect, producing a profusion of lateral shoots, covered with short linear succulent leaves. It bears flowers as large as a *Petunia*, and much the same shape, having a light yellowish tube, and a spreading limb of a beautiful pale lavender blue. To flower it well, it will probably require a dry well-drained soil, and to be exposed to a bright sunshine. It may be multiplied by cuttings with great facility.

Ny′mphæa Ru′bra. This noble aquatic has lately flowered in a trough of water, in one of the stoves at Mr. Knight's nursery, Chelsea. The flowers are elevated a few inches above the surface of the water, on long gradually ascending stalks, and are from four to four and a half inches in diameter. When the sun shines on them, the beautiful crimson purple hue of the petals assumes a hundred different shades, mingling and losing themselves one in another, almost imperceptibly. The floating peltate leaves are very deeply coloured—almost olive.

Onci′dium ——— ? Decidedly one of the most distinct and pleasing amongst the numerous known *Oncidia*, is a new species, now flowering with Messrs. Loddiges, of Hackney, by whom it was obtained from the Brazils last year. The flowers are arranged in a simple raceme, at the end of a scape, about eighteen inches long, covered with a glaucous bloom, easily rubbing off. The sepals and petals are very small, but the lip is large and prominent, in shape much like that of *O. flexuosum*. The expansive portion is bright yellow, and the crest, which is much larger than in most species, with flowers of similar magnitude, is of a rich violet-purple colour, producing a striking and pleasing contrast with the yellow. The pseudo-bulbs are roundish, and the leaves small.

OPERATIONS FOR SEPTEMBER.

The contracted length of daylight, and the diminishing fervour and intensity of the sun's rays proclaim the gradual and near approach of the severities of winter. In the more northern and elevated counties there is in fact no longer any degree of certainty or security from the withering influence of frost, which frequently occurs in the most sudden and unexpected manner, when the brightness and glow of summer-like radiance prevents the mind from anticipating evil. In all, however, upon whom the direction and superintendence of a garden devolves, an unremitting watchfulness is required, which is at no time more obviously needful, or more amply repaid, than under such a casualty as this.

Frosts which occur during the present month, rarely last long, or are very severe ; frequently they are very partial in their extent, striking the low moist grounds with their paralysing effects, whilst the side of an adjacent hill receives no harm. A wall, a tree, a hedge, or any, the most trivial protection, frequently preserves a large piece of ground from injury, and as there may in all probability, be no recurrence of them for some weeks, it is the more incumbent on the cultivator, to prevent their first attack from destroying the beauty of a summer's labour, when so slight exertion may extend the period for its enjoyment.

The plants upon which these remarks more especially bear, are usually among the principal attractions of the flower-garden, and consist chiefly of the tender greenhouse species which have been employed to fill the parterre, and grace the lawn. The intervention of a slight screen from the north during the night, and if the plants have a frosted appearance in the morning, the removing it to the south to intercept the sun from striking upon and warming them too rapidly, will generally be sufficient to preserve them from harm. And though on a large scale this may be impracticable, yet in the immediate vicinity of the mansion, and in the most pleasing portions of the ground, it is extremely desirable.

Another thing requiring the culturist's attention is the due protection of the plants in pots which have been removed from the greenhouse to the open air, to secure them from receiving any harm before they are returned to their winter quarters. And it will not be advisable to defer this later than the middle of the month on any account, and if the weather should prove either wet or very damp, it should be done immediately, that the soil in the pots may not become sodden and overcharged with moisture. Each plant must also be examined to see that the earth about its roots is free from worms, for they frequently obstruct the drainage, which is so indispensable in the winter season. If this should be found defective, it will be better to re-pot the plant than to risk it through the winter, with an inefficient passage for superfluous fluid.

When it is desirable to preserve any of the old specimens that have been planted out in borders, through the winter, either for the purpose of ornament to the greenhouse, or merely for planting out in the next spring, it will be well to have them potted by the middle or towards the close of the month, to enable them to produce fresh roots and become fairly established, before the rigours of winter are experienced. Where the necessary room can be commanded, it is prudent to retain old specimens of some of the plants commonly employed in the summer adornment of the pleasure-garden. Old plants of the *Scarlet Pelargonium* will flower sooner than young ones raised from cuttings ; and these—taken up with their roots reduced so as to occupy as small a pot as possible, and the branches which it is presumed spring from the base of the stem, cut down to within an inch of their origin—may be placed in some moderately dry and close situation that the buds may soon push, and form new shoots. Such plants as are intended to decorate the greenhouse in winter with their flowers, must be carefully taken up, and more sparingly subjected to the knife, merely removing disproportionate shoots to reduce them to a symmetrical appearance, and shortening a few of their straggling roots. The neatness of the ground where plants are taken away must be maintained, by carefully returning the soil into the holes left by their abstraction, and raking it smoothly over ; or, if there is a reserve of hardy, dwarf evergreens in pots to cover the nakedness of the borders in winter, each vacancy may be filled immediately.

Propagation must also be continued till the necessary supply of plants for another season is procured, and in considering the number, allowance must be made for the casualties which invariably destroy many, under the most judicious care, before the winter is past. To avoid disappointment in the case of early frost, cuttings of Verbenas and other tender plants must be prepared forthwith, if a sufficiency is not already obtained ; they will strike root rapidly in a gentle bottom-heat, and may either be potted out separately, or suffered to remain till spring in the cutting-pot.

In addition to these, there is yet another point demanding immediate regard, inasmuch as upon it the distribution of plants another summer, and their pleasing and effective arrangement must, in a great measure, be dependent. This is to see that each plant has its correct name attached to it, and to note its characteristics that there may be no hesitation touching the effects it will produce in the place that may be assigned to it. With Dahlias and other florist's flowers that have few obvious distinctions, save those in the colour and form of their flowers, there is a manifest cogency in this recommendation.

Every favourable opportunity should be seized on to gather the ripened seeds of annuals and biennials : sunny days, when they are quite dry, should be selected. But, though a provident care in collecting seeds is always commendable, yet the production of well-matured seeds must not be suffered to interfere with the beauty of the pleasure-ground, by leaving beds littered with dying stems of plants that have ceased to flower and are destitute of ornament. It is more suitable to reserve a few plants for this purpose in some retired part of the ground, or in a border of the kitchen-garden. An exception may be occasionally admitted in favour of some scarce or accidentally improved variety.

The extensive influx of greenhouse occupants will render the utmost ventilation consistent with preservation from injurious influences, such as frost, wind, and rain, of the more importance. The sashes may still be left open during the night, in mild weather. All the light which can be commanded may be suffered to act upon them the better to accomplish that maturity and partial desiccation, so desirable, before the cold, dark days of winter arrive. The supply of fluid to the soil in diminished quantity to all plants that have abated in the vigour of their growth, will also be of material advantage in promoting this desirable condition. Most Gesneraceous and other tuberous and bulbous-rooted plants that have flowered, may now be dried off, and removed to some shelf, where they will require little further tendance till they begin to grow.

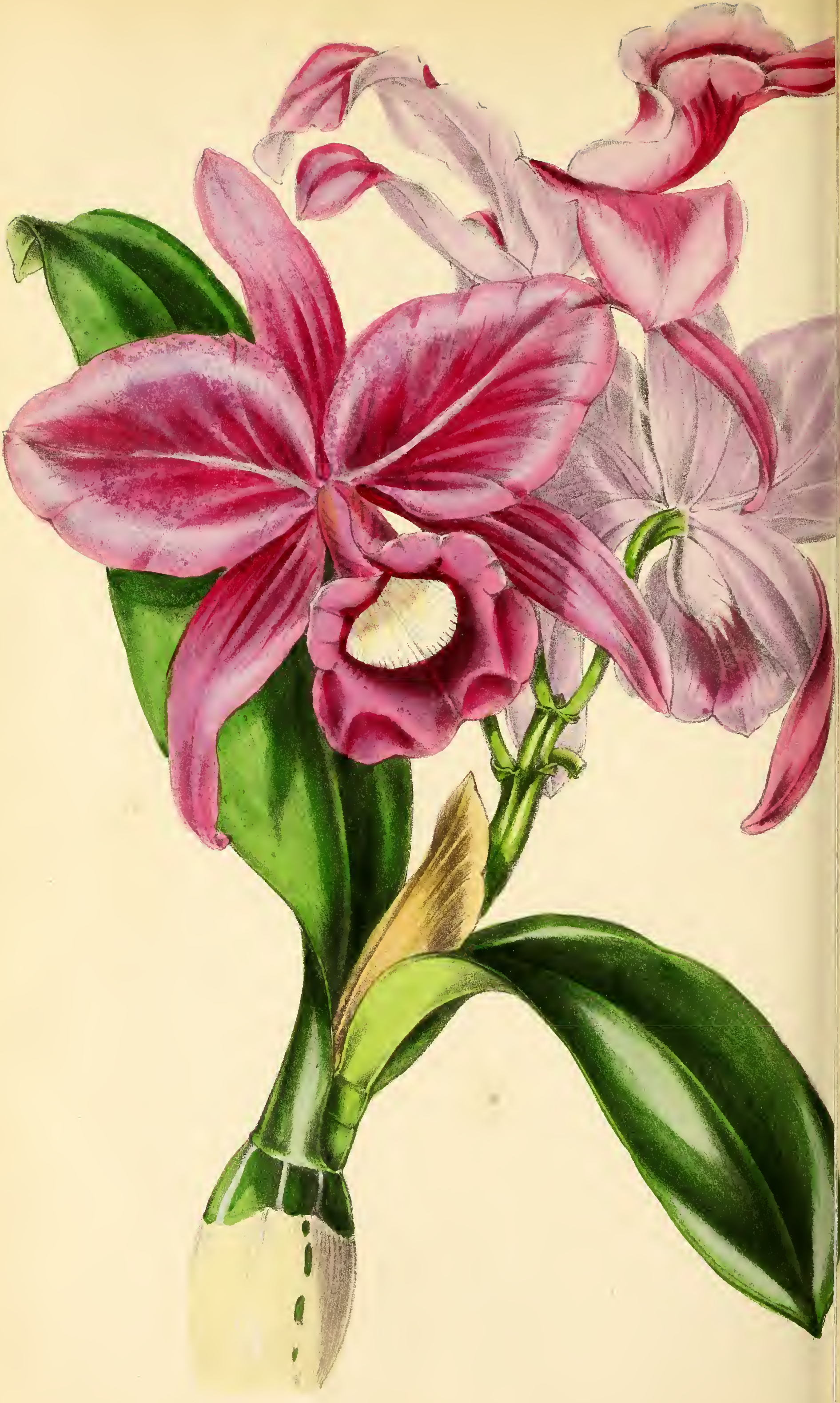
The daily increase in the decay of leaves, as they gradually acquire maturity, and having performed their particular functions in vegetable economy, are no longer either ornamental or useful, will be a source of extra employment; and as the speedy removal will be favourable both in respect of neatness and utility, it ought to be a point of daily inspection.

Much of the success and beauty of Orchidaceous plants in a succeeding season, as well as the amount of trouble and expense attending them during the coming winter, will be dependent on the treatment they receive in this and the next month. A state of torpidity is that which is now required to be promoted to the fullest extent in the greater number of species ; but as it will be equally injudicious to push this prematurely, as to endeavour to protract the season of growth beyond its proper limits by the continuation of stimulating means, it will be requisite to examine the state of the plants, and consider the weather that occurs to qualify any directions that may be given for their management. Ordinarily a much less degree of shade will be appropriate than has hitherto been employed, and the humidity of the atmosphere must be reduced both by lessening the amount of water spread on the floors and on the plants, and by an increase of ventilation.

If any alterations or repairs are necessary in the heating apparatus attached to plant structures, they ought to be forwarded immediately ; and it will be advisable to subject all to a narrow inspection, that nothing may interfere with the celerity so frequently required in bringing them into operation when sudden depressions of temperature occur during the winter.

Cleanliness cannot be too rigidly enforced, both in those parts immediately exposed to view, and also in less conspicuous places, as it eventually proves economical in preventing the accumulation of insects. A single hour's attention to this point may save a week's labour, besides avoiding the injury done to the vigour and beauty of the plants.

A few showy Annuals may be sown in pots, to flower early in the greenhouse ; and some of the more hardy species in the flower-garden, to stand through the winter and produce an early bloom in spring. Continue to tie up to stakes all plants in the pleasure-ground that are exposed to strong winds. Towards the end of the month, a few *Hyacinths* may be potted, or placed in bulb-glasses filled with water. Shrubs may be transplanted any time after the middle of the month, if the wood be at all matured, and the weather prove moist.



S. Holden del. & lith.

Cattleya Skinnerii

CATTLÈYA SKÍNNERI.

(Mr. Skinner's Cattleya.)

Class.
GYNANDRIA.

Order.
MONOGYNIA.

Natural Order.
ORCHIDÂCEÆ.

Generic Character.—*Sepals* membranous, or fleshy, spreading, equal. *Petals* frequently larger. *Labellum* cucullate, enwrapping the column, three-lobed or undivided. *Column* club-shaped, lengthened, semi-terete, margined, articulated with the labellum. *Anthers* fleshy, four-celled, with the margins of the septæ membranous. *Pollen-masses* four, caudiculæ bent back, even.

Specific Character.—*Plant* an epiphyte. *Stem* pseudo-bulbous, incrassated, jointed, compressed. *Leaves* oblong, fleshy. *Racemes* short, many-flowered, dense. *Sepals* linear, lanceolate, acute. *Petals* broadly oval, twice the width of the sepals, waved at the edges. *Lip* entire, or very obscurely three-lobed, funnel-shaped, emarginate, obtuse. *Column* about one-third of an inch long.

The richness and delicacy so strikingly displayed in some of the species of *Cattleya* can scarcely be surpassed even in the magnificent tribe of Orchidacèæ, and the softness and intensity of the rose-coloured blossoms of *C. Skinneri* entitle it to be enumerated with the most specious and lovely of the fine family of epiphytes, amongst which it is enrolled. It is slightly inferior in size to *C. labiata* and *C. Mossæi*, but its inferiority in this respect is fully compensated by the higher character of other qualities. When the blossoms first open, they are a trifle smaller, and of a more pallid hue than they are pictured, but a few days give them all their brilliancy and richness.

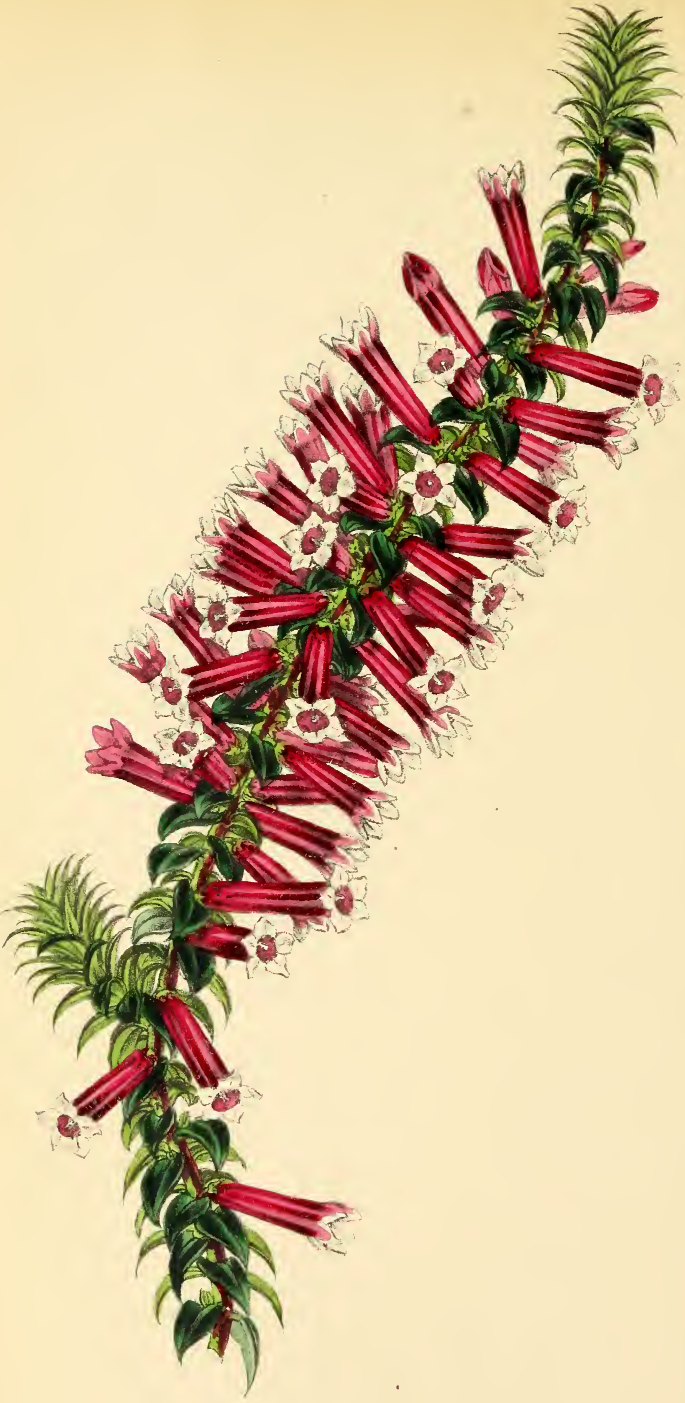
The chief distinguishing feature, independent of the form of the stem and the general contour of the flower, will be found in the extreme shortness of the column, which is considerably smaller than that of any other known species, and thus constitutes one of the most efficient means of recognising it amongst its allies.

It was first received in this country in 1836, from Mr. Skinner, whose indefatigable exertions in procuring and sending home so many of the finest species of tropical American Orchidaceæ are so well known to every cultivator of the tribe. Its vernacular appellation is stated to be "*Flor de San Sebastian*," which has evidently originated in the practice common amongst the Guatemalese of employing various flowers to decorate the temples of their favourite saints.

To arrive at cultural perfection in the easiest and most certain manner, the peculiarities of the climate in which plants are originally discovered will prove greatly advantageous. The present species is only found in the warmer parts of Guatemala, and near the southern coast, where the excessive moisture almost renders the air insalubrious. The majority of other *Cattleyas* grow in the cooler districts; consequently, whilst the latter invariably succeed best in a cool house, the present will thrive and flower better in a higher temperature with a proportionate amount of humidity.

To the obliging courtesy of F. G. Cox, Esq., who has frequently favoured us with specimens of Orchidaceæ flowered in his choice collection at Stockwell, we are indebted for the opportunity of figuring the species now selected. The drawing was prepared from a highly cultivated specimen which expanded its delicate blossoms in the month of April, and retained its beauty for a considerable period. A plant also flowered with Messrs. Loddiges, of Hackney, in the beginning of May.

The gentleman whose services as a collector are commemorated in the specific title, is a partner in an extensive mercantile establishment, and the proprietor of considerable estates in Guatemala.



S. Holden. del & Lith.

Epacris autumnale.

EPÁCRIS AUTUMNÀLE.

(Autumnal Epacris.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
EPACRIDĀCEÆ.

Generic Character.—*Calyx* scaled, or the parts of it laid over each other like the tiles of a house. *Corolla* a tube. *Stamens* inserted in the throat of the tube. *Capsule* five-celled.

Specific Character.—*Plant* a branching evergreen shrub, growing three or four feet high. *Leaves* ovate, with a mucronate termination, smooth, sessile. *Flowers* on short peduncles. *Corolla* with a deep crimson tube many times longer than the calyx, and paler, slightly spreading segments.

Synonymes.—*E. Cunninghami. E. refulgens.*

All the Epacris family are more or less useful and ornamental greenhouse plants. Their compact habit, elegance of growth, the gaiety produced by their numerous blossoms usually depending in long lines from the under-sides of the branches, and the extended duration of the flowers, are all characters which the cultivator must necessarily esteem. To these we may add that for the most part they are in the full tide of their beauty in the gloomy months of February and March.

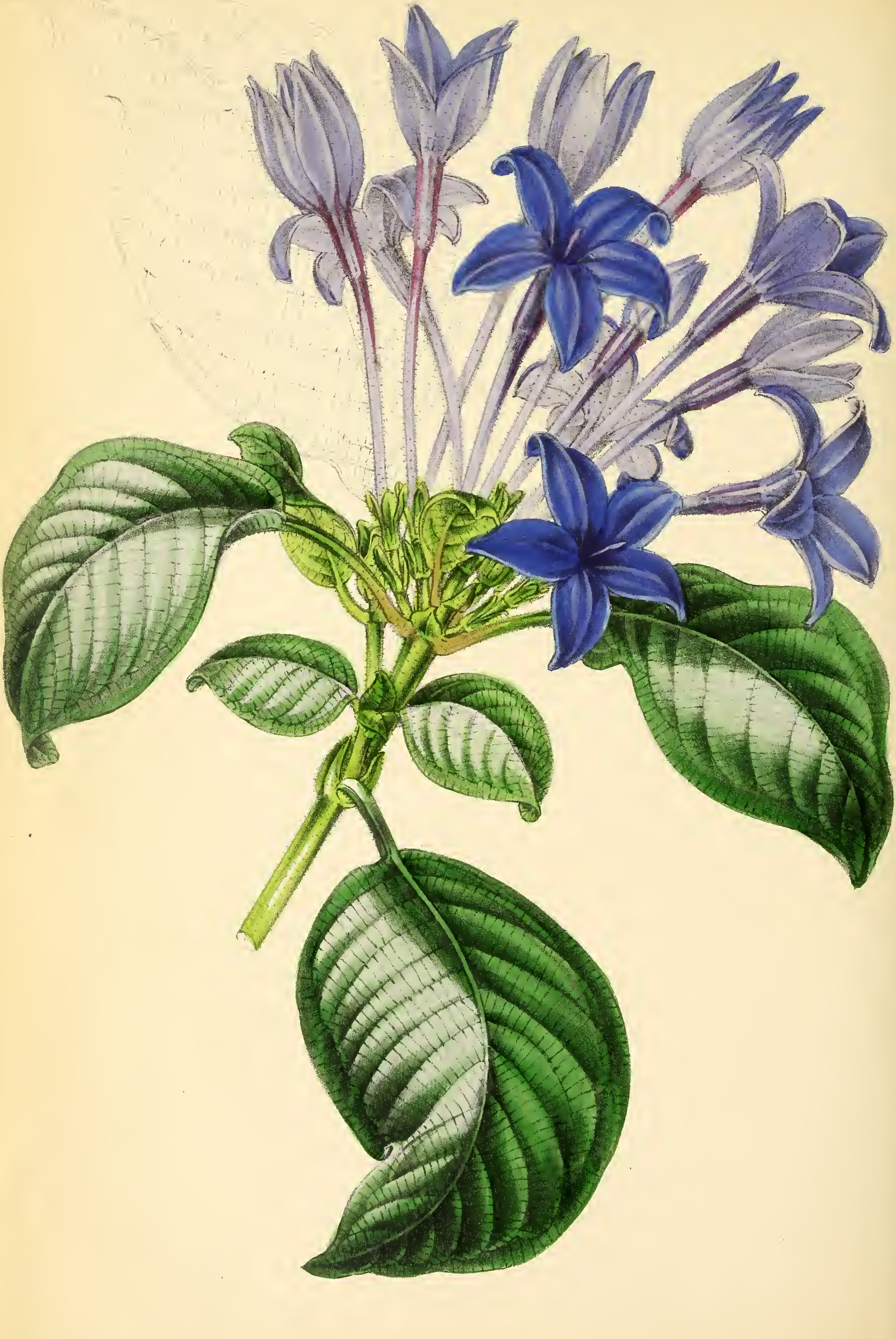
The plant here depicted is inferior in interest to few of the charming species and varieties with which we are acquainted. Its habit is that of a vigorous-growing shrub, combining with strength of stem all the elegance peculiar to the tribe, and producing richly-coloured flowers about an inch long. Unlike most of ts kindred, it commences blooming towards the end of October or beginning of November, and continues to flower through the winter till April. This feature, which is not the least interesting or useful, has suggested the specific name.

We are indebted for the opportunity of procuring our drawing to the kindness of Mr. Low of Clapton, in whose Nursery our Artist prepared it in November ast. Mr. Low obtained it from Mr. Cunningham of Edinburgh.

It is evidently of hybrid extraction. Although we are unable to state the exact source of the plant from which our delineation was executed, yet we have een others so similar in character at the Nursery of Messrs. Rollisson, Tooting, aised by Mr. Storey of Isleworth, between *E. impressa* and *E. grandiflora*, that we can have little doubt of their common origin.

In the management of this and all the stronger and more rapid-growing *Epacrises* there is one point to which we desire to direct attention. It is the common practice to employ nothing but moor-soil and sand in potting, and it is to this, perhaps more than to any other individual error, that the lack of success is attributable. If a portion of loam and well-decomposed leaves be incorporated with the heath-soil and sand, much more luxuriant shoots will be formed, and the quantity of flowers increased; for the soil being of a more open and porous nature will prevent the lodgment of stagnant water around the delicate roots, which so often, by destroying these organs, perils the very existence of the plant.

Flowering in the winter season at a time when solar light is at its minimum, it becomes more especially requisite to place them in an open part, where other shrubs may not shade them; if this be neglected, the flowers will be inferior in richness and intensity of colour. A liberal supply of water and a slight degree of shade will be needed whilst they are making their growth; and a perfect circulation of air must be maintained at all times.



S. Holden. del. & Lith.

Hindsia violacea.

HÍNDSIA VIOLÀCEA.

(Porcelain-blue Hindsia.)

Class.
PENTANDRIA.

Order.
ONOGYNIA.

Natural Order.
CINCHONÀCEÆ.

Generic Character.—*Calyx* tube turbinate; limb parted into four or five unequal segments, linear, or dilated, and leaf-like at the extremity. *Corolla* funnel-shaped, tube elongated, a little inflated at the top, and bearded within between the stamens; throat naked; limb five-cleft, segments ovate, æstivation valvate. *Anthers* linear, near the top of the tube, almost sessile. *Ovary* two-celled, placentæ affixed to the middle of dissepiments. *Ovules* numerous. *Style* with long linear branches, covered with compressed papillose hairs. *Capsule* inferior; septicide two-valved; loculicide two-parted. *Seeds* numerous, destitute of wings.

Specific Character.—*Plant* a branching, spreading, softly pubescent, evergreen shrub. *Stipules* ovate. *Leaves* broadly ovate, rounded at the base, acute, sulcate beneath, wrinkled, longer than the petioles. *Peduncles* two-flowered, short. *Calyx* segments very unequal, spatulate, acute. *Corolla* four or five-lobed, tube very long; segments oval, acute, fleshy; throat naked. *Stigma* filiform, exserted.

The propriety of retaining the plant figured at page 217 of vol. VIII., in the genus *Rondeletia*, has for some time been doubted by botanists, and a careful examination of that species and the present has at length induced Mr. Bentham to form them into a new genus, which he has defined with the characters given above.

The Botanical Register contains the following remarks on the matter by Mr. Bentham:—" It is much to be regretted that these plants should have been referred to *Rondeletia* from which they differ so much in appearance, and from which they may be essentially distinguished by the form of the corolla, rather funnel-shaped than salver-shaped, without any callous contraction or beard at the mouth of the tube, by the capsule which separates by the splitting of the dissepiment into two cocci (dry elastic pieces), which are loculicidally split, and by some other minor points."

Independent, however, of other characters, the absence of the coronal appendage at the throat of the tube, is a distinction by which the genus may be known from *Rondeletia*, by every cultivator; and, although the alteration of any name which has once become universally established, is always attended with some confusion, and is unwarrantable without great and obvious reasons, the present and its ally, (now *H. longiflora,*) are so evidently erroneously referred to *Rondeletia*, as to render this step in their cases not only perfectly admissible, but desirable.

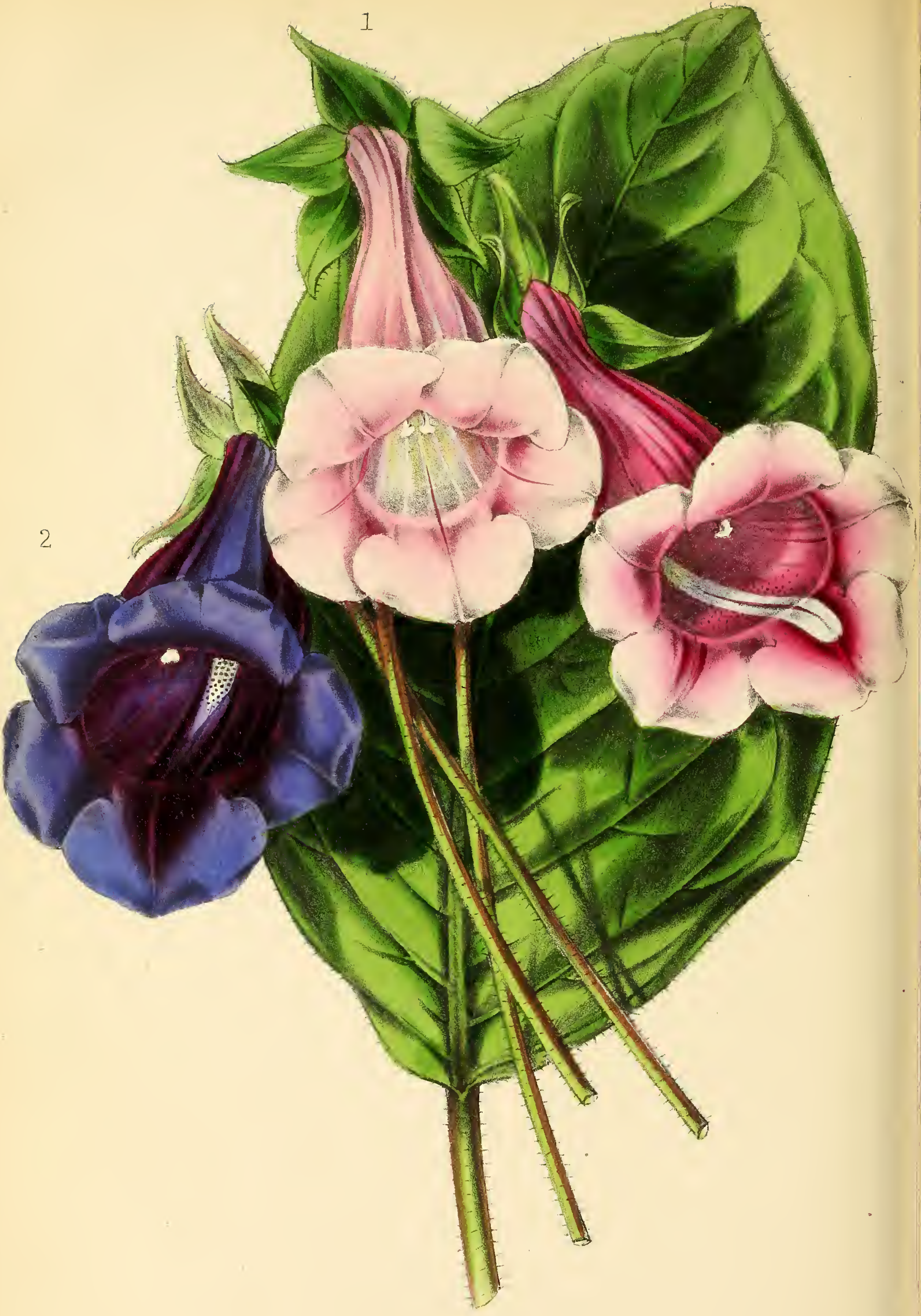
H. violacea is in every respect a superior plant to the other species, and is, unquestionably, one of the finest stove plants of recent introduction. It is distinguished by its more luxuriant and spreading habit, and the greater magnitude of its leaves and blossoms. The leaves also are more deeply furrowed and hairy, and the flowers have greater substance, the petals being of a thick fleshy consistency and having a rich velvety-looking surface.

It is a native of South Brazil, and was first discovered by the collector sent out to explore that country by Messrs. Veitch and Sons, of Exeter, and by him transmitted to their nursery about three or four years since, and having been extensively propagated by cuttings, which strike root readily in sand under a glass with a gentle bottom-heat, now exists there in considerable quantity.

It commences flowering early in the spring, and a large specimen with numerous clusters of its violet-blue flowers standing on the extremity of the shoots, on the outside of the plant, was exhibited at the Chiswick and Regent's Park shows in May and June. The extreme profusion of the branches gives it a very compact character, and as they are also more disposed to spread and form a bush, than to grow erect and long, like those of *H. longiflora*, it may be more easily managed. By a trifling attention to stopping the growing shoots, it may be made dwarf to any desirable extent. As a flowering shrub for exhibition, or the more legitimate purpose of adorning the stove or a warm conservatory, it will be found extremely useful.

Young plants in a very dwarf state are easily flowered by keeping them in small pots. But where large specimens are desired they should be allowed ample room for the extension of the roots, using a peaty soil enriched with a little loam and leaf-mould.

R. B. Hinds, Esq., a zealous naturalist, whose plants, collected for his own private use, are now in course of publication at the expense of the public, is commemorated in the present genus.



S. Holden del. & Lith.

Gloxinia's, Seedling var.

1. Cerina 2 Speciosa superba 3 Cartonii

GLOXÍNIA SPECIÒSA SEEDLINGS.

(1. Cerini. 2. Superba. 3. Cartoni.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
GESNERÀCEÆ.

GARDEN HYBRIDS.

The simplicity of the hybridising process, and the facility of procuring seeds of he various species of *Gloxinia*, and especially of *G. speciosa*, have induced many to ttempt the production of novelties. These endeavours have been successful in ringing out many delightful improvements on the original kinds. But as in all ases where plants are once brought under the florist's notice, an infinity of seedings have also been raised which exhibit little or no superiority over the parent pecies; we have, consequently, selected the three represented in the accompanying late, with a view to give prominence to some of the most eminent improvements. hey are all sufficiently distinct from each other to be admitted into the same ollection ; and at present stand unrivalled in their respective classes.

The first, *Cerina*, is a seedling raised by Messrs. Mountjoy and Son, of the aling Nursery, who favoured us with specimens in the summer of 1843, accomanied by the following remarks :—" Our *Gloxinia cerìna* was raised from seeds f *G. rubra* crossed with *Sinníngia guttàta*, and it partakes very much of the abit of the *Sinníngia*, flowering up the stem more freely than *Gloxinias* generally o, and the foliage is quite distinct from any other *Gloxinia* we ever saw, being uch rounder and more villose : the whole habit and growth of the plant is xtremely robust, even when in a very young state. We have found that it, as ell as all the varieties of *Gloxinia*, produces flowers of a much finer colour when owered in a cool-house, than if kept constantly in the stove."

The other varieties, Nos. 2 and 3, were obtained at Messrs. Henderson's ursery, at Pine-apple Place. *Superba* is a seedling raised by those gentlemen bout two years ago, and is chiefly remarkable for the unusual depth and richness of its violet hue, far eclipsing the original species. *Cartoni*, we understand, was obtained by Mr. Carton, gardener to the Duke of Northumberland at Sion, by a similar cross-fertilization to that employed by Messrs. Mountjoy and Son, when they produced their *Cerina*.

The main art in managing *Gloxinias* well, is to give them a porous and well enriched soil, to grow them in a warm and moist atmosphere, and as soon as they begin to flower to remove them to a cooler house, and afterwards to dry them off gradually and keep them free from moisture till they again begin to grow. The richest colours are usually produced in a somewhat mellowed light; indeed, an examination of a flowering specimen frequently exhibits a few blossoms partially shaded by the leaves, and in almost all cases these will be found of a richer tint than the more exposed blossoms. We have particularly observed this in *Cartoni* and *Cerina*.

GARDENING AS A SCIENCE.

VEGETABLE PHYSIOLOGY.—No. IX.

THE *inflorescence*, or the development of the organs of fructification, now claims ur consideration. It is the end, the consummation of all the vital functions, the esult of that great natural law which ordains the reproduction of vital germs, so rganised as to become the representatives of their parent. In this comprehensive iew of fructification, we include all the theoretic principles which can be adopted vith safety; for it is plain that, if there be any truth in analogy, all beings ndowed with life have periods of infancy, youth, and maturity; and that the eproductive powers are to be referred to the last of these periods. We therefore isclaim, in toto, the modern theory of Morpheology, (that is, Science of FORM), nasmuch as it in no way elucidates the phenomena of fructification.

A flower is a part, perfect in itself, the offspring of an adult or mature plant, nd composed of members, exactly adapted to the processes which they are rdained to perform. Without interfering with the province of the structural otanist, it will not be irrelevant to notice all the parts which are essential to nflorescence, and to allude, in passing, to the notions which have been entertained f their origin and offices. A complete flower consists of an empalement, or xternal covering of some sort, usually called *calyx*. This is composed of several ortions more or less divided, termed *sepals*, which in most subjects are green, and omewhat similar to leaves; but, in others, variously coloured. Within, or above he calyx, is the *corolla*, or proper flower-bloom. Many flowers have not both alyx and corolla, and in that case modern physiologists consider the single nvesting member a *calyx*, and call it so. The term corolla is only admitted, herefore, when the coloured member is more or less enclosed by a true, exterior alyx. The corolla is composed of *petals* or flower-leaves, various in figure, egular or irregular, distinct, or more or less cohering. The corolla is sometimes urnished, as in the Crown Imperial, (*Fritillaria Imperialis*), with certain well-efined secreting organs. Yet this is not indispensably required; for, although lants secrete a sweet (not always *salubrious*) fluid which bears the name of ectar, yet the secretion may be effected by unseen, glandular processes. Nectar an exudation of a peculiar combination of oxygen, hydrogen, and carbon, hich might chemically be styled *basal honey*, since it requires only to be re-borated within the animal organism of the bee to become true honey.

Within the calyx and corolla are seated upon the floral receptacle—now called he *torus*,—those essential organs of fructification, the stamens and pistillum; the tter, under whatever term it is found in botanical treatises, is the origin of the uit or seed-vessel. It comprises an ovary, a style, and a stigma. It is thus ncifully described by a writer who advocates the singular modern hypothesis, hat every organ of a plant is derived from the budding of leaves.

"The seed is wrapped in a small leaf, which, instead of expanding its beauties to the sun and air, like its neighbouring petals, folds itself closely round the little treasure it is to protect: the edges of the two opposite leaves of the leaf being thus brought in contact, *unite and grow together,* and the *leaf assumes the form of a pod* or vessel, the shape of which varies according to the form of the leaf, and the manner in which it was folded when it first budded."

Again: "When this leaf is closed over the seed, and its edges *soldered* together, it is called an *ovary* or seed-vessel. From its summit rises a little thread-like stalk, called a *style*, which at its extremity supports a small spongy substance denominated *stigma*. These three parts form a whole, which bears the name of Carpel."

The simple facts concerning the structure of the pistil in the above extract, are plain and elucidatory; the value of the flowery illustration of the true Morpheological Theory will speak for itself. That the pod of a bean, pea, or other species of the leguminous tribe is nothing more than a *leaf* glued or soldered together at its edges, is somewhat startling; we therefore leave the hypothesis to its own merits.

The *pistil* being the central organ of the flower, and the envelope of the seeds, is surrounded, more or less, by the stamens in such plants as have both in the same flower; for there are many, wherein the stamens and pistil are apart, and even in different plants. The structure of a stamen usually comprises a slender filament, at the summit of which is attached, in various ways, a little cellular organ (filled with small vesicles) called the *anther*. As the vesicles ripen, they become the fine dust or pollen, botanically termed *Farina.*

Each granule of farina is cavernous; and at the period of perfect maturity, it explodes when it comes in contact with the moist surface of the stigma, a fact which appears to be corroborated by microscopic investigation. Upon this fact are founded the theory and practice of impregnation.

There are many difficulties attendant upon the theory; and these are increased by the known circumstance, that the male and female organs of the same plant are, in numerous instances, entirely separate; in others, wherein both organs exist in the same flower, yet the anthers cannot come in contact with the pistillum. As, however, artificial impregnation is now extensively resorted to, in order to produce new varieties, we must be content to believe that which is highly probable and thus sanction the partial analogy that appears to exist between the anima and vegetable creation.

If we admit the theory of impregnation of seeds by the agency of the "farina fructicans," it is essential to inquire minutely into the laws which govern thi wonderful process, and the limits to which they extend. The following paragraph from the article "*Impregnation*" of the Cyclopædia of the Society for th Diffusion of Useful Knowledge, will be read with interest:—"In a perfec plant, the anther or male organ contains a matter called pollen. The pollen is congeries of excessively small hollow cases, having to the eye the appearance of small dust. Each grain contains a mucilaginous matter, in which there float granules, often not exceeding the twenty-five thousandth part of an inch in diameter. The female organ, or pistil, is a hollow case, of considerable size compared with the pollen grain; it bears ovules, eggs, or young seeds in its interior, and is furnished at its apex with a lax, naked, secreting tissue, called the stigma. At the proper time the anther discharges its pollen, which, by contrivances of various kinds, is made to fall upon the viscid stigma, to which it sticks. In that situation, each grain of pollen emits one or more fine transparent *tubes*, which plunge into the lax tissue of the stigma, and descend to the vicinity of the ovules, with which they eventually establish a communication through the foramen of those organs. Into the pollen-tube thus emitted, the molecular and mucilaginous matter originally contained in the pollen is discharged, and, passing along it, eventually arrives in contact with the ovule."

Whether or not there be something purely imaginative in this description —the latter part of it particularly—we leave to the acumen of observant microscopic investigators to decide; yet there is a general feature of truth in the leading points that every one who has paid minute attention to the hybridization of the Pelargonium and Gloxinia must, we think, admit.

Let us advert to the white-blossomed species of the latter. Its stigma is a bold disc, glutinous, and therefore fully prepared to retain and act upon the tissue of the pollen grains. We never, in the course of ten years, witnessed the production of one ripened capsule of seeds. The blue varieties sometimes produce ripe seeds spontaneously; but the white (*Gloxinia candida*), being almost destitute of farina, requires artificial impregnation, and this produces some fertile seeds. It has been said that there exists great uncertainty in attempting its impregnation by the farina of *G. rubra;* but, whatever be the result as to variety, we have at this time several seed vessels well developed, by impregnation with the *rubra*, among a multitude remaining entirely abortive, although each was touched with the farina of the same red species, transferred and applied liberally by means of a camel-hair pencil.

As therefore, the process of artificial impregnation is uncertain in its results, failing with some blossoms and succeeding with others, though performed at the same time, and precisely in the same manner, it follows that the condition of the pistillum and stigma must be peculiar in order to insure success. This condition is one of *maturity*, which can only be ascertained by great experience and minute individual observation. It is a study worthy the attention of the most intellectual physiologist, embracing one of the most refined theories of horticulture.

It is the *gardener's province* to push the doctrine of impregnation to its utmost practical nicety; the physiologist advocates theories and principles, which the practical man brings to the test of experience. We claim, therefore, the general admission upon strict principles of analogy, that no impregnation can take place between species remote in their conformation and habits; hence the philosophical inference, that bees and other insects, which certainly transfer the pollen indiscriminately, must fail to impregnate those embryos which are foreign in their nature to those of the plant, whence any individual farina has been abstracted.

Again—flowers, in all their sexual organs, must be correspondingly mature, otherwise the attractive energy between the fluids of the pollen and those of the stigma cannot be so exerted, as to induce the development and absorption of the impregnating effluvia.

From all that has been advanced,—from the structure and organisation of the roots, the stem, the vascular, cellular, and fibrous tissues of the wood, bark, leaves, and their progressive advances from the germination of the seed to the maturity of the plant, according to the laws of its individual nature, we trust it will be apparent that the organs of fructification are as true and specific as any other portion of the vegetable structure. We are fully prepared to admit that anomalies are of common occurrence, for we find leaves protruding among the petals of the rose, and learn from experience that, by crossing and confinement, some plants (by no means the greater number) may be made to develope blossoms, as it were prematurely. But there is not one fact which distinctly proves that blossoms, seed-vessels, and fruits, are neither more nor less than transformed leaves —leaves inverted, contorted, moulded to new purposes. There is something so monstrous, so degrading in the idea, that the mind, which contemplates all things as beautiful and perfect in their creation, revolts at the idea. We are told that full or double flowers are monsters, rendered such by the transformation of the styles into petals; and so, then, the noble, most perfect double, or full Camellia, is nothing more than a degraded single flower! Is this the fact—do our amateur friends believe that they ever witnessed, ever could witness, a transformation so astonishing? Again, is it possible for one moment to admit, rationally to conceive, that the firm, rigid, and fibrous tissue of the Camellia leaf, ever was or ever could be changed into the delicate, cellular, highly-tinted *petal* of the expansive double blossom? There is a fashion, it is evident, in physiology, as well as in dress and decoration, and the wise too often yield to it!

ON GROWING ACHIMENES.

Few plants that have lately been introduced to this country can compete with the many beautiful species of *Achimenes*, which are now become so universally and extensively cultivated. Almost all the qualities that we esteem as constituting loveliness and beauty are possessed by some one or other of the different kinds.

So far as the routine of potting and watering, shading, and temperature are instrumental to the vigour and health of plants, the cultivation of this genus seems to be generally and fully understood. But there is, nevertheless, a few incidents connected with them that are yet but partially known, and as they are eminently conducive to that elegance and gracefulness, as well as beneficial in the encouragement of that showy abundance of flower so universally valued, we purpose to offer a few observations, conceiving that anything likely to increase the interest they are capable of exciting, will not be regarded as superfluous.

It is well known that the slender stems of *A. longiflora* are unable to support themselves with the weight of their leaves and flowers, in an upright position. To obviate this, many resort to the expedient of employing a multitude of sticks, and tying out each shoot separately. There is, perhaps, no way in which a really beautiful plant can be more injudiciously treated, for what is really elegant and pleasing in itself is thus rendered stiff and unnatural. Besides, it is almost impossible that the sticks can be concealed by the foliage, and when they stand so glaringly and conspicuously, they are still more exceptionable. If supports are to be employed, they ought by all means to be well concealed, and the plants loosely and skilfully attached to them ; so that whilst they are effectual in giving support, a stiff, constrained, or a bundled appearance may not be produced.

What has been said of *A. longiflora* may also be applied to *A. pedunculata*, and *A. hirsuta*, with almost equal propriety. These species are of a taller growth, and though much more robust than the first, they are, nevertheless, too frail to maintain an upright posture without aid. There is also a disposition to elongate rather more than is desirable, as the flowers are thus placed too widely apart.

Hitherto, pot-culture has been almost the exclusive practice: but, whilst we acknowledge the excellency which has already attended it, and its superior suitability as a general method, we may yet question the propriety of confining ourselves wholly to it. A few deviations from ordinary usage, judiciously introduced, are always pleasing in the additional variety they afford.

The slender stems of *Achimenes* hang so gracefully when unconstrained by the confinement of sticks, that a basket in which they might be grown and suspended, would seem more suitable, and there are few things more delightful or enlivening than a number of graceful forms hanging from the roof of a house, when the plants so treated manifest a willingness to accommodate themselves to the circumstances.

We have repeatedly seen the old *A. coccinea*—better known, perhaps, as *Cyrilla pulchella*—treated in this style ; and, though it does not thrive with equal luxuriance to that which may be reached when grown in a pot, the deficiency in that respect is fully atoned for in the increased profusion and richness of the blossoms, and in the loose and graceful posture. *A. longiflora* yields with similar readiness to this treatment, and experiment will, doubtless, prove it to be equally congenial to others.

Another advantage may be expected to accrue, when *A. pedunculata*, *A. hirsuta*, or like species are employed. The excessively luxuriant habit of these plants, when fully encouraged to grow, rather diminishes the abundance of their blossoms, and they have consequently been regarded by many as shy and indifferent bloomers. However, this is far from being the case when partially restricted in its growth, by using a poorer soil and a smaller pot. In the garden of the Horticultural Society at Chiswick, a plant, which had accidentally sprung up amongst the moss on a block of wood in the Orchidaceous house, has flowered with extraordinary freedom. And if several plants were placed in a basket, and the stems permitted to hang loosely over the sides, and entangle themselves one with another, and having been conveyed round the under surface of the basket, afterwards allowed to resume an erect position, their increasedly numerous ramifications would produce a complete mass of flower, which, from being brought into closer proximity, would have a more gorgeous effect.

Perhaps the most eligible kind of basket for growing them in, is the hemispherical one generally used for *Stanhopeas*. But for the sake of additional variety many other forms may be employed, models for which may be observed in almost every extensive collection of Orchidaceæ. Blocks of wood will, probably, be found approvable, where the roots can be enveloped in a moderate casing of moss.

The baskets may either be filled entirely with moss, in which they root pretty well, or the centre may be filled with an open fibrous soil, and a layer of moss placed round the outside to prevent it from washing away. But a better method will be to fill the basket with a very fibrous peat, as free as possible from small, fine earthy particles. A well-decomposed swarth from a common, grows them admirably; indeed, they are far from difficult to suit in the medium for the roots. When they can be procured, the old decayed root-stocks of Ferns, such as *Aspidiums*, will be a very appropriate material.

It may be questionable whether the plants will succeed best if the roots are planted in the basket before they begin to grow; or whether it may not be more advisable to transplant young specimens already started in small pots and grown a few inches in length. This may soon be decided by practice. Whichever way may be adopted, they should be spread over the whole surface, both upper and under, or at least upon the top and sides, so that the basket may be concealed as much as possible.

In many stoves and intermediate houses, the back wall is covered with rough pieces of bark or wood, disposed in such a manner as to admit a portion of moss to grow Ferns, or Orchidaceous plants. A few plants of the different species of *Achimenes* inserted among these, will add a very agreeable feature. The only care required, will be to select places where there is some material for the roots to spread into, and where they may not be smothered with other things.

Every one, moreover, who has been in the habit of visiting collections of Orchidaceæ, must have been struck with the disagreeable predominancy of the dark-brown colour of the blocks of wood, &c., to which the plants are attached, over the green hue of the foliage. As a means of giving a more lively appearance some cultivators have occasionally planted *Lycopodiums.* This, however, might as effectually be attained by a limited introduction of *Achimenes.* A few plants stuck into the sides and lower parts of the baskets and suspended pieces of wood, would have a charming effect; and for this purpose, the usually long stems of *A. pedunculata* would be no objection; for, when so treated, the internodes are always shorter, and the shoots may be conveniently attached to the sides of the larger baskets and blocks.

The moist, shaded atmosphere of the Orchidaceæ house is likewise eminently suited to the cultivation of *Achimenes;* indeed, a degree of shade is positively necessary to some of the species when in flower, the blossoms of *A. longiflora* being frequently much injured by exposure to a bright sun.

Before closing our remarks, we will just advert to the probability of these plants enduring one summer in the open ground. It is not likely that they will ever be available to any great extent for the flower-garden, but in a warm dry situation, in a rocky border in front of a greenhouse, or stove, it is probable that they may be successfully managed during the warmer months of summer. From experiments made in one of the metropolitan gardens, shade during intense sunshine seems particularly necessary, even in the out-door borders, as the plants always flower best in cloudy weather, or early in the morning, but are injured directly a hot sun shines upon them. In Messrs. Lee's nursery, *A. pedunculata* has stood the winter in an exposed border without any care or attention, but has only made a poor stunted growth without any appearance of flower. From these facts we may reasonably infer, that the idea of growing them in the open air is by no means unlikely to prove successful to a greater extent than has hitherto been attempted; and we cordially recommend our readers to endeavour to ascertain the fact for themselves, when another season furnishes the opportunity.

NATURAL MODE OF TRAINING CLIMBERS.

Although climbing plants are among the freest and most graceful growing objects in the vegetable kingdom, cultivators generally have a practice of materially curtailing their beauty by training their branches in straight lines, and tying them closely to that which supports them.

Such a proceeding, indeed, by robbing them of that wild elegance which is their principal charm, converts them into comparatively tame and uninteresting things, and detracts greatly from the attractiveness of a garden scene, whether in the open air or the plant house.

A climber, when it is decked in its native grace, should have all its minor branches free and flowing; and if the train stems are not hidden by side shoots, they too should take that irregular, crooked direction which they would be inclined to do in a state of nature. All endeavours, therefore, to train them in anything like order, or place their branches by rule in parallel lines, unless with the view of giving them effectual support till they have acquired strength enough to develope a due proportion of lateral branches, are much to be deprecated as destructive of the true and natural expression of the plants.

Starting, then, with the assumption that climbers, to display their real charms, ought to be treated *naturally* in the way of training, and not be permanently forced into any approach to regularity of growth, we may go on to give these remarks a practical turn, by applying them to a variety of the cases which are of commonest occurrence. Before doing this, however, it is necessary to define a little more explicitly what we mean by imparting to climbers their own natural appearance.

If we examine a climbing plant in a wild condition, we shall soon have a sufficient illustration of this point. Springing up at the base of a mass of bushes which vary considerably in height, or near a tree or a group of trees, they fling their flexible shoots over the former in all directions, until they themselves appear to constitute the bush, while its own branches are only here and there visible at the extremities. Or, entwining the stem of a tree, they continue mounting till they reach its branches, and then throw themselves along these, depending carelessly from their points. In these examples we have the type of what we call the natural treatment of climbers.

To apply it first to those beautiful dwarf summer plants, of nearly herbaceous habits, such as Tropœolums, Maurandyas, Thunbergias, Lophospermums, &c., we may observe that the custom of training these over trellises of various forms is by no means suited to their character; nor does it at all contribute to heighten their effect. Their own natural elegance is lost in such circumstances, and they are rendered far too formal to be pleasing.

The better way of managing these plants is to put one or several bushy stakes into the pots or the ground where they are growing, and let the plants scramble over these in their own fashion, simply assisting them when they seem likely to fail in clinging properly to their support, or when the young stems are disposed to wander away in another direction. This may easily be done by the use of a small piece of matting occasionally, or by placing the shoots so completely amongst the branches of the stake which is to sustain them, that it will be almost impossible for them to extricate themselves.

In this manner, if the size of the stakes be duly adapted to the strength of the plant, the latter will form a close and dense bush, presenting long waving shoots, studded with blossoms all over its surface, and exhibiting those free, flowing characteristics which render climbers the admiration of every one.

Nor is the adoption of this system to be limited to plants that are of only very limited growth, and whose branches disappear every summer. Some of the more woody and rambling kinds that grow in the open ground may be fitly subjected to similar treatment, if it be judiciously carried out. Specimens of *Clematis* or Honeysuckle might be planted in the midst of a number of strong bushy stakes, and allowed to throw themselves over these in wild negligence. When such objects have attained their full perfection, they would make most peculiar and interesting features on a lawn.

But the more satisfactory mode of accomplishing the purpose with plants of so large a character as the species of *Clematis* or Honeysuckle, would be to plant a moderate-sized Lilac—or other shrub which would be ornamental in itself—in the required position on a lawn, and put in the climbers around it. These last would, in process of time, completely envelope the shrub that sustained them, and yet that shrub being alive, would constitute a more permanent support than any dead and severed branches could possibly do, while its foliage and blossoms would always supply any defect or vacancy that might occur from the climber not completely covering it.

The practice of which we have been speaking is by no means to be considered applicable only to climbers in the open ground, or even to include alone, in addition to these, such dwarfer sorts as will readily compress themselves into a small compass. We have already mentioned the charming Thunbergias among low-growing kinds, because the plan is so peculiarly appropriate for them. But many Kennedyas and other plants of the like character might be treated according to the same principles, and would yield an amount of novelty and beauty which would quite astonish some cultivators.

In the beds and borders of pretty extensive conservatories, too, the taller and more vigorous-growing kinds might find a suitable place. A mass of *Clematis Sieboldii* or *cœrulea*, for example, or some of the well-known species of Passion-flower, or several of the *Ipomœa* tribe, would look extremely well when suffered to overrun a common shrub; and, entangling their branches in every possible way, create a large bush, profusely enlivened with both verdure and blossom.

The other class of climbers to which we alluded in the commencement comprises the tall-growing species just mentioned; but, instead of their inwreathing their branches into a bush, they ascend some stem or pole, and fling out their drooping and flower-laden shoots from near its summit. Of this tribe, the wild Honeysuckle and *Clematis* constitute familiar illustrations.

To train these in a manner resembling the natural one, they require a tall pole, but to render this still more like nature, it should have a quantity of branches on the top; and as these branches would soon decay and fall on a dead pole, it is desirable to have living trees, of a common description, for supporting tall climbers. A young elm would be especially suitable; and if it were transplanted at the time of putting in the climbers, so as just to retain its vitality but to check its extreme vigour, those climbers would speedily outgrow it, and prevent it from spreading too wildly.

In some parts of most pleasure gardens, there are generally one or more trees

—sometimes very old and decayed, but occasionally quite young—overgrown with Ivy, and becoming yearly all the more beautiful from being thus enveloped, even though the Ivy be constantly strangling and destroying the natural growth of the tree. By planting the wild *Clematis* or Honeysuckle at the bottom of such trees, and encouraging it to ascend them, and mingle itself with the Ivy, the picturesqueness of the object would be very materially increased, and the best of all positions furnished for the climbers.

Such is the strength of the vegetative power in Ivy, however, that unless the other climbers be planted by its side while it is quite young, there is a great chance that it will smother them as well as the tree. To avoid this, therefore, the *Clematis* should be inserted near it as soon as it is at all perceived to be attaching itself to any tree with a likelihood of ultimately outgrowing it.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR SEPTEMBER.

Alo`na cœle´stis. In our notices last month at p. 190, we described this plant as a new species of *Nolàna*. On referring to the contemporary number of the *Botanical Register* (t. 46), we find Dr. Lindley has broken up that genus into five ; *Alona*, with two or three exceptions, being composed of shrubby species.

Asti´ria ro`sea. This plant was received about eleven years since along with *Trochetia grandiflora* (see p. 92), from the Mauritius, by His Grace the Duke of Northumberland, and flowered in the gardens at Syon about the close of last March. "The fine, broad, heart-shaped leaves, and close clusters of pink flowers, render it a rather handsome plant." *Bot. Reg.* 49.

Barle`ria fla`va. "A very little known plant, as it would appear. It is a native of Arabia, and has been long cultivated in the stoves of the Botanic Gardens at Kew, where it flowers in the winter months, and makes a very pretty appearance with its bright yellow flowers among the large calyces and bracts." It is an erect shrub, with smooth dark green branches clothed with oblong lanceolate leaves. The flower-spikes are very dense, and stand at the termination of the shoots. It is known in many gardens as *Justicia* or *Eranthemum flavum*, as well as under the name here given. *Bot. Mag.* 4113.

Corethro`stylos bracte`ata. "This is one of the most striking of Swan River shrubs, but owing to some difficulty in cultivating it, the specimens that have been produced in Europe are very inferior to the wild ones. In the latter the bracts are four times as large, and of the most vivid rose colour, thus rendering the bush indescribably gay ; for the long loose clusters, adorned by these bracts, are produced in multitudes all over the plant. We entertain no doubt," continues Dr. Lindley, "that when the habits of the plant shall have been more correctly studied, it will become a general favourite. In the meanwhile, it is as well to know that the foliage is very sweet-scented. It is a greenhouse shrub, and will probably succeed best if potted in rough peat, well mixed with one-fourth silver sand. During the summer season a liberal supply of water should be given, and as much air as possible. In winter it should be treated in the same manner as Cape heaths, never applying fire heat, except to keep off frost. It may be propagated by cuttings in the usual way." The genus takes its name from the Greek words, *corythron*, a broom, and *stylos*, a style, and applies to the hairiness of that part. (We take advantage of this opportunity to allude to a typical inaccuracy in the generic name in our notice of this plant at p. 118 of the present volume.) *Bot. Reg.* 47.

Epide´ndrum radiatum. "Allied to both *E. cochleàtum* and *lancifoliam* ; this pretty species is distinctly known by the round form and crisp margin of its lip, which, moreover, is almost notched out in the middle, and very delicately streaked with purple. Its petals, too, are both shorter and broader than in either of those two species. Its habit is precisely theirs; and the three, considering their constant flowering and very neat appearance, deserve a place in all collections. Besides, this species smells deliciously of cinnamon. The Horticultural Society's plants were received from Mexico, where they were gathered by Mr. Hartweg. Dr. Schiede also collected specimens in that country, on rocks, at the Hacienda de la Laguna. *Bot. Reg.* 45.

GLOXINIA SPECIOSA VARIETIES. This is a neat group of four handsome seedling varieties —*magnifica*, *insignis*, *bicolor*, and *Cartonii*—grown at Mr. Glendinning's nursery, Turnham-Green. "They were first raised in the gardens of the Duke of Northumberland at Syon, by his Grace's gardener, Mr. Carton, who has been long celebrated for producing various interesting novelties by hybridizing." They were obtained from *G. speciosum*, fertilised with the pollen of *Sinningia guttata*. *Bot. Reg.* 48.

LACA'ENA BICO'LOR. "This fine plant was sent to the Horticultural Society from Guatemala, by Mr. Hartweg, who found it in the mountains of Salama, in the province of Vera Paz; also near the village of Sunil, near Quezaltenango, in Guatemala, growing on rocks, at an elevation of about 7,000 feet above the sea. In May, 1843, it produced its flowers, and ever since has been in such bad health that it is doubtful if it will survive. In habit, the species is so like some of the *Peristerias* with pendulous racemes, that it would certainly be mistaken for them, and in structure it approaches them no doubt very closely. It is, however, essentially distinguished by the labellum and pollen apparatus. In *Peristerias*, the labellum, although having a moveable joint in the middle, is continuous with the column by a thick fleshy base; here the articulation at that part is very conspicuous. The *Peristerias* have four pollen-masses; here we have but two. And, finally, the strap by which the pollen-masses adhere is long and slender, like that of a *Lycaste*, not deficient, so as to render the pollen-masses sessile upon a crescent-shaped gland, as in *Peristerias*. The flowers of this plant are formed in a pendulous raceme, as much as eighteen inches long; the lower part being clothed with distant short blunt scales, which extend into bracts about half the length of the pedicels. Each raceme consists of nine or ten flowers of dull greenish-yellow, covered externally with short hairs; their petals have three streaks of violet; their lip is downy all over the upper surface, dark purple in the middle, with two or three spots of the same colour near the point. In the centre of the lower half is a large shaggy hump." *Bot. Reg.* 50.

LEPA'NTHES SANGU'INEA. Mr. Purdie, a collector for Kew Gardens, found this plant on the high mountains of Jamaica, and sent specimens home. "It does not seem to be a described species, but is nearly allied to *L. tridentata* of Swartz; differing from it in the colour of the flowers, in the latter being always erect, not resupinate, ciliated all round the borders of the calyx, and in the much shorter peduncles. It is rather a botanical curiosity than a florist's plant, and forms a striking contrast with the majority of Orchideous Epiphytes." It is a very diminutive plant, growing in tufts among moss on the trunks of trees, in its native regions. At Kew it is attached to a small piece of the husk of a cocoa-nut. *Bot. Mag.* 4112.

LOMA'TIA TINCTORIA. "A native of Van Diemen's Land, and introduced thence by the late Mr. Allan Cunningham to the Royal Gardens at Kew, where it flourishes and flowers best in a cool frame. The specific name was given by M. Labillardière, in consequence of the rose-coloured dye produced by the mealy dust which clothes the seeds when infused in water. It flowers during the summer months with us." In its native country, this shrub is said to grow five or six feet high; but it rarely reaches more than two or three feet in England. The upper part of the stem runs out into a long raceme of sulphur-coloured flowers, tipped with green, especially before they open. *Bot. Mag.* 4110.

SACCOLA'BIUM GUTTA'TUM. "Nothing can exceed the delicacy and texture of the racemes of the flowers; and Dr. Roxburgh observes, that they are not inferior in beauty to any of the whole tribe of Orchidaceæ. It is a native of the East Indies, and it appears to have first blossomed in Europe in the Kew Gardens, in 1820. The plant flowers in the spring months, continuing long in perfection. It is cultivated on a portion of the branch of a tree, to which the roots cling sufficiently to give it support." The racemes of flowers are sometimes nearly a foot long, furnished with delicate white flowers, spotted with purple, forming a dense cylindrical mass. *Bot. Mag.* 4108.

THOMA'SIA STIPULA'CEA. "This fine species, with its large purple flowers, seems unquestionably the *T. stipulacea* of Dr. Lindley's Swan River Botany, and it is probably the *T. macrocarpa* of Hugel, but there are some discrepancies in the description. It was raised from New Holland seeds, sent by Mr. Drummond, in the Royal Botanic Gardens of Kew, where it bears its copious flowers in autumn." It is a small bushy shrub, growing two or three feet high, with rather large heart-shaped leaves, sinuated on the margin. *Bot. Mag.* 4111.

NEW OR INTERESTING PLANTS FLOWERED IN THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

AGANI'SIA PULCHE'LLA. Messrs. Loddige, of Hackney, introduced this delicate and interesting little plant from Demarara in 1836, and a specimen is now producing its very neat blossoms in one of their stoves. It has several ascending rhizomas, upon which the long, tapering pseudo-bulbs encased in brownish scales are formed at intervals of two or three inches, and surmounted by a rigid and somewhat plaited oval, lance-shaped leaf, acutely pointed at the extremity. The flowers are borne in racemes which spring from the base of the pseudo-bulbs, and though not remarkable for large dimensions, they are peculiarly attractive, from the delicacy and fragility of their texture. The sepals are somewhat broader than the petals, and both are of that glistening white rarely seen but in Orchidaceæ, and which we can only compare to the pellucid appearance of half melted snow. The lip presents a little variety, having a considerable dash of yellow in it, and purple spots at the base. It is well-deserving of a place in choice collections, and may be grown in a pot or basket filled with rough, fibrous peat; but, perhaps, a block of wood, to which it may easily be attached and then suspended from the roof, will accord best with its habit.

ÆCHME'A DI'SCOLOR. At the last meeting of the Horticultural Society, at the rooms in Regent Street, a specimen of this plant was exhibited, from the Society's Garden at Chiswick. It is a very ornamental stove-plant of the Bromeliaceous order, remarkable for the brilliant scarlet hue of the panicled flower-stem and calyces. The petals are of a soft pink or purple tint, and protrude a little beyond the outer envelope. The leaves are broad, minutely dentated on the margin, and rather purplish underneath. Deprived of its flowers, the plant something resembles a miniature pine-apple. It requires a genial bottom-heat, and a rather liberal supply of water during the growing season, and will thrive in any soil that is not of a too retentive nature.

BEGO'NIA MARTIA'NA. This is a strikingly showy species of *Begonia*, with long striated stems growing very erect, and furnished with rather small leaves of the usual oblique form, deeply and unequally indented at the edges, and covered with a thin, glaucous bloom. The flowers are more richly coloured than the generality of *Begonias*, for, whilst a white or very pale pink is the usual colour, we have here a much deeper shade, almost approaching crimson. It is a very free and quick growing kind, and makes large bushes when encouraged by the use of a moderately rich soil, and allowing sufficient pot-room. Specimens have been flowering for a long time in a very superior style at Messrs. Henderson's of Pine-apple Place, and at the Exotic Nursery of Mr. Knight, Chelsea.

BIGNO'NIA CHAMBERLAY'NII. In a stove at Mr. Knight's Nursery a large specimen of this showy species, trained under the roof, is flowering beautifully. The blossoms are very large and of a rich yellow colour, and being produced in profuse quantities over a large portion of the surface of the main branches, they constitute a very engaging feature. It would, doubtless, succeed well in a warm greenhouse, and as it is one of the more abundant flowering species, it must be a desirable acquisition. Like many other magnificent members of the same genus it is, however, very rarely met with. It is a native of Brazil, from whence it was imported as long ago as 1820.

DIPLOPE'LTIS HUGE'LII. A curious greenhouse plant, of a slender, suffruticose habit, and easily induced to form numerous ramifications, by occasionally pinching of the extremity of the growing shoots. The stems are hairy, and furnished with small, opposite, cuneate leaves, roughly and unequally toothed towards the end. The flowers are borne in long, loose panicles, and consist of four pink petals, and a disc of a peculiar construction. It is one of those plants which look very insignificant under careless management, and, when well cultivated, have an elegant and highly interesting appearance. It is only as a bushy specimen, with numerous panicles of its lively pink blossoms produced over the whole upper surface, that it is worth preserving. In a sheltered place it will exist out of doors in the summer months. It was introduced from the Swan River, in 1837. Plants are flowering in one of Messrs. Rollisson's greenhouses, at the Tooting Nursery, Surrey.

ECHI'TES CARA'SSA. We have for some time past been watching this plant in several of the London nurseries, but have never been gratified with a sight of its blossoms till a short time ago; a specimen flowered, and still continues to develope blossoms, in the select collection of R. G. Loraine, Esq., of Wallington Lodge, Carshalton. We believe this to be the first and only specimen which has yet displayed its flowers in this country. A high character was received with it from the Continent, whence the plants in the English nurseries were obtained, and as, indeed, might be inferred from its habit, it proves a most beautiful thing. The flowers are smaller than those of *E. splendens*, and rather deeper-coloured, with a yellow or orange-coloured throat, which greatly augments their interest. It has the habit of a slender twining shrub, with leaves much after the same form as those of the species just alluded to, but much smaller and smoother, and more shining. Mr. Loraine obtained it from Mr. Lowe, of Clapton.

ECHI'TES SPLE'NDENS. Messrs. Henderson, of Pine-apple Place, exhibited a well-cultivated specimen of this superb plant at the Horticultural Rooms, on the third of September, with several trusses of flowers formed, and one with expanded blossoms. The flowers last for a week or ten days. It is decidedly one of the most splendid of recent introductions, and fully realises all that has been said in its favour.

GESNE'RA MACRORHI'ZA. We believe this is a new species, and have not observed it any where except in the nursery of Mr. Glendinning, of Turnham Green. It is rather a low-growing kind, and has stems densely clothed with whitish setaceous hairs. The leaves are very large, and extremely soft and velvety. It flowers near the top of the shoots, producing a pair of blossoms about as large and brilliant as those of *G. Cooperii*, from each node, supported on peduncles about two inches long.

HABROTHA'MNUS CYA'NEUS. In the Horticultural Society's Garden, trained against the conservative wall, a specimen of this new shrub is producing its charming deep violet blue blossoms. These are collected into clusters at the extremity of the shoots, and are borne on semi-pendant peduncles, rather more than half their length. The calyx is large, and has a distended appearance, spreading slightly at the end; it is of a very bright grass green. The corolla is straight and tubular, widening at the end, and a little undulated at the edges. The shrub grows three or four feet high, and manifests a disposition to flower freely, but it is doubtful whether it will prove sufficiently hardy to endure our winters without protection. Nevertheless, as a greenhouse plant, it will be hailed as a valuable acquisition, especially as the hue of the flowers is one that so unfailingly attracts attention. It was introduced, by Mr. Hartweg, from Mexico. Cut specimens were shown at the late meeting in Regent Street.

IPOMŒ'A KRUSENSTE'RNII. A stove species bearing this name has recently flowered in the nursery of Messrs. Henderson. It is a remarkably vigorous growing species, emitting strong and rather succulent semi-translucent shoots, which rapidly spread over a large surface. The leaves are undivided, nearly heart-shaped, perfectly smooth, and of a deep glassy green colour, with long foot-stalks. It bears large white flowers, but unfortunately these are usually closed about the middle of the day, and only expand in the morning and evening, each individual flower enduring but for a few hours; there is, however, a tolerably abundant succession. It is a Mexican species, and has been known four or five years in British collections.

ISOCHI'LUS CARNOSÆFLO'RA. An elegant-growing plant, with graceful slender leafy stems, about a foot or eighteen inches in length. The flowers are borne in cymose racemes at the tip of the shoots, with which they almost form a right angle. They are closely aggregated, and of a rich purple colour, but so small as to be barely interesting enough to notice. The trivial name is suggested by their fleshy substance. There is a considerable resemblance between this plant and *Ponera graminifolia*. Specimens have recently flowered in Messrs. Loddige's collection at Hackney.

JUSTI'CIA VENU'STA. This plant is chiefly worthy of distinction for the extreme profusion of its deep violet blossoms, which are produced in immense and very much branched panicles, terminating the shoots. Individually, they are rather too small, compared with other parts, to be considered showy; but this is sufficiently atoned for, by their astonishing numbers. It is a shrubby species, with very stout short jointed wood, and large ovate leaves, frequently a foot long. It was imported from Bengal some years back, and a specimen is flowering with Messrs. Rollisson of Tooting. It requires to be grown in a stove, and as it produces an abundance of strong roots, it will also be necessary to furnish it with a roomy pot.

Lo'asa lu'cida. The peculiarity which has prompted the specific name of this plant, the glossy brightness of its leaves, is also a most agreeable feature in its general aspect. The chief portion of the flowers is white, enlivened in the centre with bright yellow and crimson. It is apparently an annual species, and has a climbing habit. Trained neatly round a small wire trellis, studded over with its lively-looking blossoms, it is an interesting object in a greenhouse. A plant has been flowering nearly all the summer in a greenhouse at Messrs. Henderson's nursery, Pine-apple Place.

Lobe'lia fu'lgens, *var.* Two beautiful and very superior varieties of this showy herbaceous plant have been raised by G. Symons, Esq., of Lyme Regis, Dorset, and flowered lately in the nursery of Messrs. Veitch and Sons, of Exeter. *L. fulgens multiflora* has downy leaves and very large flowers; it produces a multitude of spikes, varying from two to three feet high. *L. fulgens pyramidalis* has bright glossy leaves, and rather smaller, though richer and deeper-coloured blossoms. It is a very strong and vigorous grower, the majority of the spikes rising about four feet. They are decidedly two of the most magnificent hybrids yet produced.

Lupi'nus pube'scens. There is a great similarity amongst the herbaceous species of Lupines; the present, however, seems to be well distinguished by the numerous downy hairs which completely cover both stems and leaves. The flowers are borne in very long spikes, and are of a deep rich violet blue. It was introduced to the gardens of the Horticultural Society by Mr. Hartweg, who discovered it about Quito.

Spara'xis Wa'ttii. Amongst a large collection of bulbous plants, received late last spring from the Cape of Good Hype, by R. Mangles, Esq., of Sunning Hill, Berks, was a new species of Sparaxis, bearing the foregoing specific title. It flowered a short time ago, and proves to be a very showy kind, nearly allied to *S. bicolor*, but very different in colour. The flowers are elevated on a slightly flexuose scape, and have a long tube elbowed at the throat, after which it gradually dilates, and is divided at top into a spreading limb of six segments, the three uppermost of which are the largest, and of a deep violet hue, a trifle paler towards the base; the lesser and lowermost three are turned up at the margins, and have a beautiful lemon-coloured centre, margined with rich violet; the throat also is lemon-coloured, and streaked very distinctly with narrow dark lines.

We here insert some notes that were made last month, but for which there was not room in the previous number.

Eleoca'rpus cy'aneus. It is seldom that we have the opportunity of witnessing well-flowered specimens of this plant, and its beauty, when covered with blossom, is, consequently, little known. A noble plant, five or six feet high, is flowering in the Chiswick Gardens. The stem and branches are literally encased with racemes of small white fringed and pendulous blossoms. This snowy moss, peeping from between the large elliptical foliage, has a peculiarly engaging look. The specific name refers to the fruit, which is blue, in form and size something like that of the *Billardiera scandens*, but is rarely produced in this country. The supposed and most probable cause of the unusual abundance of flowers was the extreme drought, heat, and light to which the specimen was exposed last year.

Gompholo'bium ——— ? A new species is flowering at the Nursery of Messrs. Lowe, Clapton. It was raised from Swan River seeds, received from Mr. Drummond, about two years ago. Like *G. Hendersonii* (lately figured), it has a rigid erect habit, with heath-like foliage, and carries its flowers in tufts, at the extremity of the shoots. It appears to grow more freely, and will probably be increased with greater facility.

Gloxinia macrophylla. Messrs. Lowe have plants in flower of this handsome species, imported from the Brazils by Messrs. Veitch and Son, of Exeter. It differs from *G. speciosa* in having much larger leaves, and those are also glaucous at the veins. The flowers are large, of a deep violet colour, and very pretty, but only slightly different from *G. speciosa.*

Lina′ria pi′scis. Remarkable for its large flowers, which equal those of *L. dalmatica*, and for the extreme length of the spur, which is striated with purple on a pale yellow ground. The palate is deep yellow, inclining to orange. The form of the blossom, in its fancied resemblance to the shape of some kind of fish, seems to have suggested the specific name. Three or four, and sometimes five, smooth and rather glaucous leaves are disposed in whorls round the stem. The height rarely exceeds eighteen inches. We owe our knowledge of it to a plant flowering in Messrs. Henderson's Nursery.

Pterodi′scus specio′sus. The attractive appearance of this plant will undoubtedly secure to it an ample share of public esteem. Whether we attach consequence to the beauteous form, the exquisitely soft colour, or the magnitude of the flowers, it casts itself before us with each of these qualities in a more than ordinary degree of superiority. The roots are somewhat similar to those of the bulbous *Gesneras ;* the stem and leaves are more like a *Salpiglossis*, and have a smell of musk. We have not seen it above a foot high, but think it probable that a stronger plant would grow taller. The flowers are large, similar in form to the *Amphicòme argùta*, but much larger and deeper-coloured, and are produced from near the top of the stem.

OPERATIONS FOR OCTOBER.

Whatever remarks may be offered in any calendar for the direction of monthly operations, they will frequently demand much modification in practice, owing to the changeableness and uncertainty of our climate, and the great variety of local circumstances. These incidents will frequently render it advisable to defer attending to particular operations at the exact season recommended, and also to refer to the details for the guidance of a preceding month, and observe what has unavoidably or intentionally been omitted till a more suitable period. Much of what was said last month will apply with equal propriety to this, and in some individual cases may be more appropriately considered as the fit operations for October.

That which usually demands a large amount of the culturist's care in this month, is the arrangement of plants in the situations which they are intended to occupy during the winter ; to provide protection equal to the requirements of each ; and to bring them into the most suitable state for enduring rigorous weather without receiving injury, and at the least expense.

The most tender plants were recommended last month to be immediately removed to the greenhouse, or otherwise protected, in the event of frosty or stormy weather occurring. If there has hitherto been no occasion for doing this to any great extent, it must not, however, be postponed any longer, for the uncertainty of the weather increases as the season advances. *Verbenas, Calceolarias, Petunias,* and the most part of the plants usually required for the flower-garden in summer should now have their pots examined, and then plunged to the rim in a frame amongst ashes or saw-dust, or some similar material, to keep them from parting too rapidly with their moisture, and thereby needing a more frequent application of water in the winter months. The bed in which they are plunged should be raised, so as only to leave a few inches between the tops of the plants and the glass, to give them all the benefit of the diminished intensity of the light, and also to place them in a better circulation of air. Both these conditions are of the utmost importance to the healthy preservation of plants through the dark dull days of winter.

A more extensive provision may be reserved for the summer garden by storing away plants in *Vineries* and other unemployed houses not intended for forcing, always being careful to elevate them within a short distance of the roof. The more tender kinds, such as *Heliotropes* and *Scarlet Pelargoniums*, &c., are the most proper to place in the houses; pits and frames usually being too damp for them. To make still more space, all deciduous plants and bulbs may be placed on shelves in a dry place.

Many plants, such as the more tender species of Pines, whilst they require some protection, may yet be preserved in a more economical manner than by placing them in pits. A well-sheltered, dry and airy corner should be selected, and the pots plunged in a bed of coal-ashes, covering them two or three inches deep. This will prevent cold from injuring their roots ; and the tops may be protected with a light moveable temporarily constructed frame, covered with mats or canvass, placed over them in severe weather, and always removed in the day time, when it can be done with safety. All hardy plants in pots must also be plunged in beds of ashes to prevent the frost breaking the pots by expanding the soil.

Plants against conservative walls will require to be looked over, and the shoots securely trained. It will be advisable now to put up canvass curtains to draw before the plants in frosty weather ; and a quantity of litter or dried fern should also be at hand to lay over the roots. Delicate plants designed to remain in the pleasure ground are most easily protected with branches of the Spruce Fir.

A state of torpidity must be promoted in the plants placed in pits and frames to the fullest extent ; and in order to effect this, it will be expedient to avoid all unnecessary moisture, to water as seldom as the demands of the plants will permit, and to give air at every suitable opportunity to assist in carrying off moisture, and at the same time to keep the atmosphere cool. Should any unduly vigorous shoots be formed, cut them away immediately.

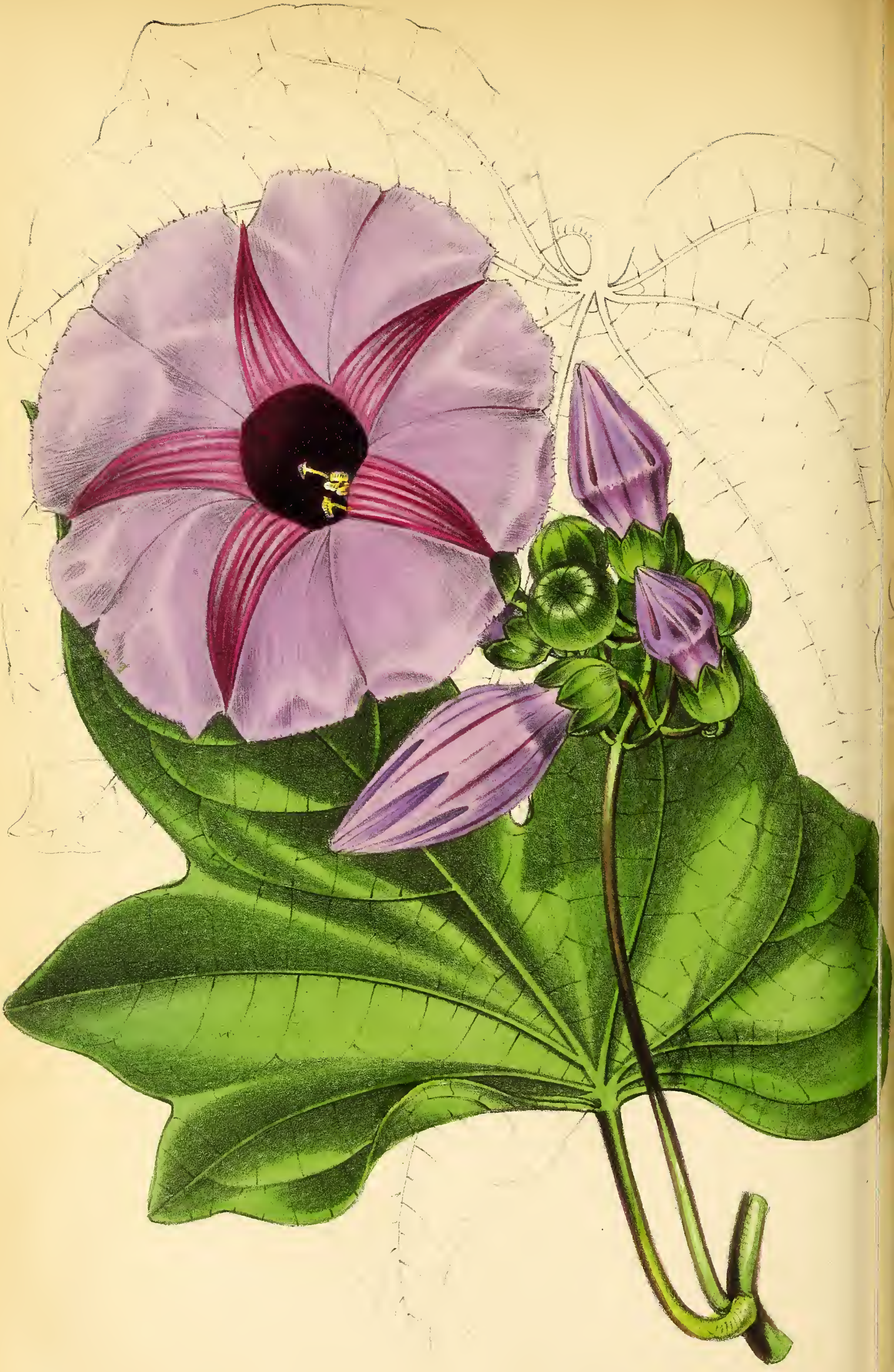
These directions are equally applicable to the greenhouse and stove, where all plants, except such as naturally grow at this season, should have their wood speedily matured and indurated before winter. All the plants which have been brought in lately must have their branches regularly disposed, so that one may not interfere with another when they are arranged together. It will, moreover, be necessary to give each specimen sufficient room to admit light on all sides of it, for if they are placed together in a crowded manner, the leaves will sicken and decay, and greatly deteriorate the beauty of the plants. Climbers and plants of rambling growth must be confined within proper limits by judicious training and pruning, and every means employed to give room for the greatest number of specimens without interfering with the healthiness of any.

In the Orchidaceous house, those plants in pots that have been plunged in tan-beds must now be raised to the surface, with a view to keep them both drier and cooler. Specimens in a state of inaction should be collected, and placed as much as possible by themselves, so that they may the more easily be kept in the necessary state of aridity. The gradual diminution of moisture in the atmosphere, which is so essential at this period, renders it more favourable to the multiplication of insects, which if not crushed at the outset, will speedily increase and swarm through the houses. The devastation they commit in so short a time, by defacing the beauty of the leaves, should be a sufficient incentive to an early care and assiduous perseverance in checking their progress. Shades need never be employed after this period till the return of spring, except in a few particular instances.

Where bulbous and tuberous rooted plants, such as Hyacinths, Anemones, &c., are esteemed, this is the most suitable period for preparing beds for their reception ; and as they are among the most enlivening ornaments of the pleasure ground in spring, we would recommend them to be more generally introduced. By planting them tolerably early, they not only bloom sooner, but more vigorously. A few good Hyacinth and Narcissus bulbs may also be potted now, and brought into gentle heat, covering them over with leaves, old tan, or saw-dust in the usual way. The chief advantage of the covering is the uniformly moist condition in which it preserves the soil, without the necessity of frequent waterings. The bulbs put in now may be expected to flower about the middle of January.

In the pleasure ground all the decayed and flowerless stems of herbaceous plants and annuals that have either completed their growth or been destroyed by frost, should be effectually cleared away. Dahlias, however, ought not to be cut down immediately, though the frost impairs their beauty, as the tubers will be better matured if they are allowed to stand till towards the close of the month ; or if the weather is pretty dry, and not too severe, November will be quite early enough. Clear away all the flower stakes that are no longer needed, clean them carefully, and store away in some dry shed.

Any straggling growths in the choice shrubberies may now be cut away ; and cuttings of many hard-wooded plants taken of, and inserted in some partially sheltered border, will root readily. When it is desirable to form banks of dwarf Laurels, cuttings may be put in now where they are to remain. Such banks are very interesting when neatly managed and happily situated. All kinds of planting may be proceeded with.



S. Holden. del & Lith.

Ipomæa Hardingii

IPOMŒA HARDÍNGII.

(Mr. Harding's Ipomœa.)

Class.
PENTANDRIA.

Order.
MONOGYNIA.

Natural Order.
CONVOLVŬLACEÆ.

ENERIC CHARACTER.—*Calyx* of five sepals. *Corolla* mpanulate. *Stamens* inclosed. *Style* one. *Stigma* o-lobed; lobes capitate. *Ovarium* two-celled; cells o-seeded. *Capsule* two-celled; cells two-seeded.—*m's Gardening and Botany.*

PECIFIC CHARACTER.—*Plant* a twining herbaceous perennial, with tuberous roots, somewhat scabrous. *Leaves* three-lobed or sometimes obscurely five-lobed; cordate at base; middle lobe ovate, acute; both upper and under surface covered with short hairs. *Peduncles* long, hairy. *Pedicels* very much shorter. *Flowers* numerous, racemose.

So well appreciated are the ornamental qualities of many species of *Convol-*
lus and *Ipomœa*, that there are few collections of plants without some one or
her of the numerous kinds which have been introduced finding a place amongst
e climbers. It is, however, rather surprising, comprising as they do so many
owy species, both with blue flowers, and all the various shades of red and
imson, that so few attempts have been made to obtain new varieties.

The subject of these remarks, we understand, is one of the few which have
iginated in this way. It is stated to have been raised between *I. rubro-cerulea*
d *I. Horsfallii;* but it differs very much from both of these species, and we
ould rather have suspected *I. scabra* to have been one of the parents, as it
proaches that species more nearly in its characteristic features.

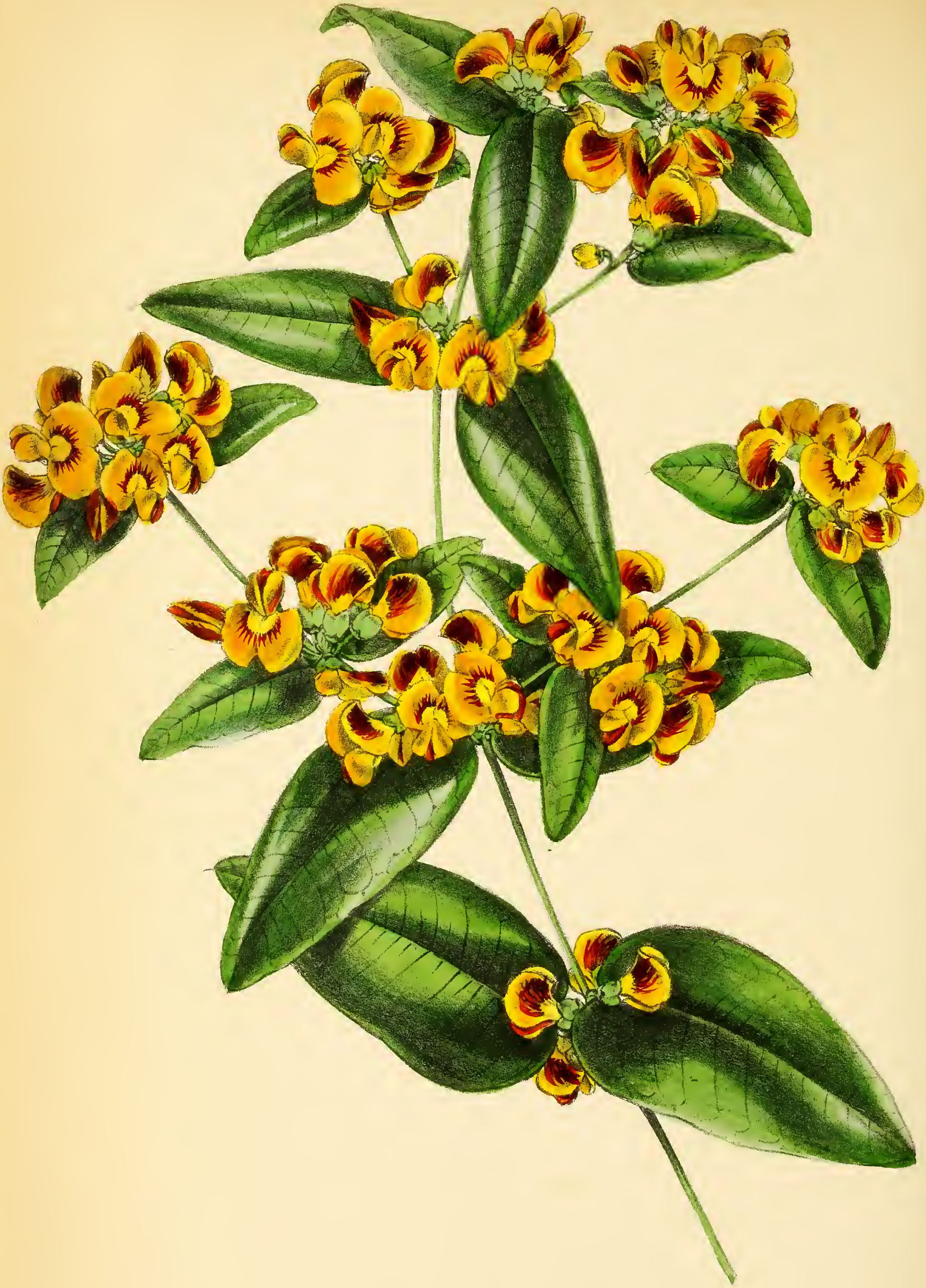
It was raised by Mr. Harding, gardener to H. Bevan, Esq. of Glynn Garth,
eaumaris, and the entire stock was purchased by Messrs. Henderson of Pine-
ple-place, in 1841, who bestowed the specific name we have adopted, and have
voured us with the foregoing account of its origin. Several specimens have been
owering in their Nursery for the greater part of the past summer, and from one
f these the prefixed representation was prepared in July.

From *I. scabra* it is readily known, that species having a rougher surface, and
e leaves more deeply three-lobed. *I. gossipifolia*, another species in the same
ay, differs in the form of the foliage, and in being a perfectly smooth plant.
either of them are equal to *I. Hardingii,* either in the size of the clusters, or the
dividual beauty of the blossoms.

The stems do not naturally die down every year, as is usual with mos tuberous-rooted plants, but in order to have good specimens they should be cu away, and new shoots encouraged to grow from the base. These shoots commonl grow rather luxuriantly, and should therefore be closely trained in a spiral manne round a barrel or some similarly formed trellis, which will soon be perfectl concealed by the number and breadth of the leaves.

When vegetation first begins to move in the spring, all the mould should b shaken away from the roots, after which they may be repotted, in a moderatel rich and open earth, using much smaller pots, and then placing them in a fram with a gentle bottom-heat. As they grow, and the roots fill the pots, others thre or four sizes larger should be substituted. They do not flower well in a green house unless kept rather close, and a stove will always suit them better.

It is increased by cuttings of the less luxuriant shoots, put in sand and treate in the ordinary manner.



S.Holden. del & Lith.

Platylobium parviflorum

PLATYLÒBIUM PARVIFLÒRUM.

(Small Flowered Platylobium.)

Class.
DIADELPHIA.

Order.
DECANDRIA.

Natural Order.
LEGUMINÒSÆ.

Generic Character.—*Calyx* bracteate, two-lipped; upper lip bifid, roundish, large. *Stamens* all connected. *Legume* pedicellate, compressed, flat, winged on the back, many-seeded.—*Don's Gardening and Botany.*

Specific Character.—*Plant* an evergreen shrub. *Leaves* ovate-lanceolate. *Ovary* ciliated, smoothish. *Bracteas* glabrous. *Stipe of Legume* exceeding the calyx.

Unfortunately amongst the Leguminose plants of New Holland there exists a very great similarity in the colour of the flowers; orange and yellow being the most prevalent. We ought not, however, on this account to reject them, if they are otherwise deserving of a place in the greenhouse; for, although the colours approximate so closely in different species, there is, nevertheless, a wide variation in their habits of growth, in the size, and even in the proportion of the form, and in the position of the inflorescence, that greatly relieves any uniformity of colour. Moreover, in forming miscellaneous collections it is easy to obtain plants of other colours to create variety in that respect also.

Our reasons for bringing forward so old a species as the present are, the almost mmoderate quantity of flowers which it produces when properly managed, and the rarity of good specimens notwithstanding the years that have intervened since t was first known in British collections. Altogether, it is decidedly a shrub of no mean appearance, and being one that by a slight modification of treatment may be kept as a low dwarf bush, or induced to grow two or three feet high, maintaining its bushy character by numerous ramifications constantly forming, it is one that has considerable claims to the attention of cultivators.

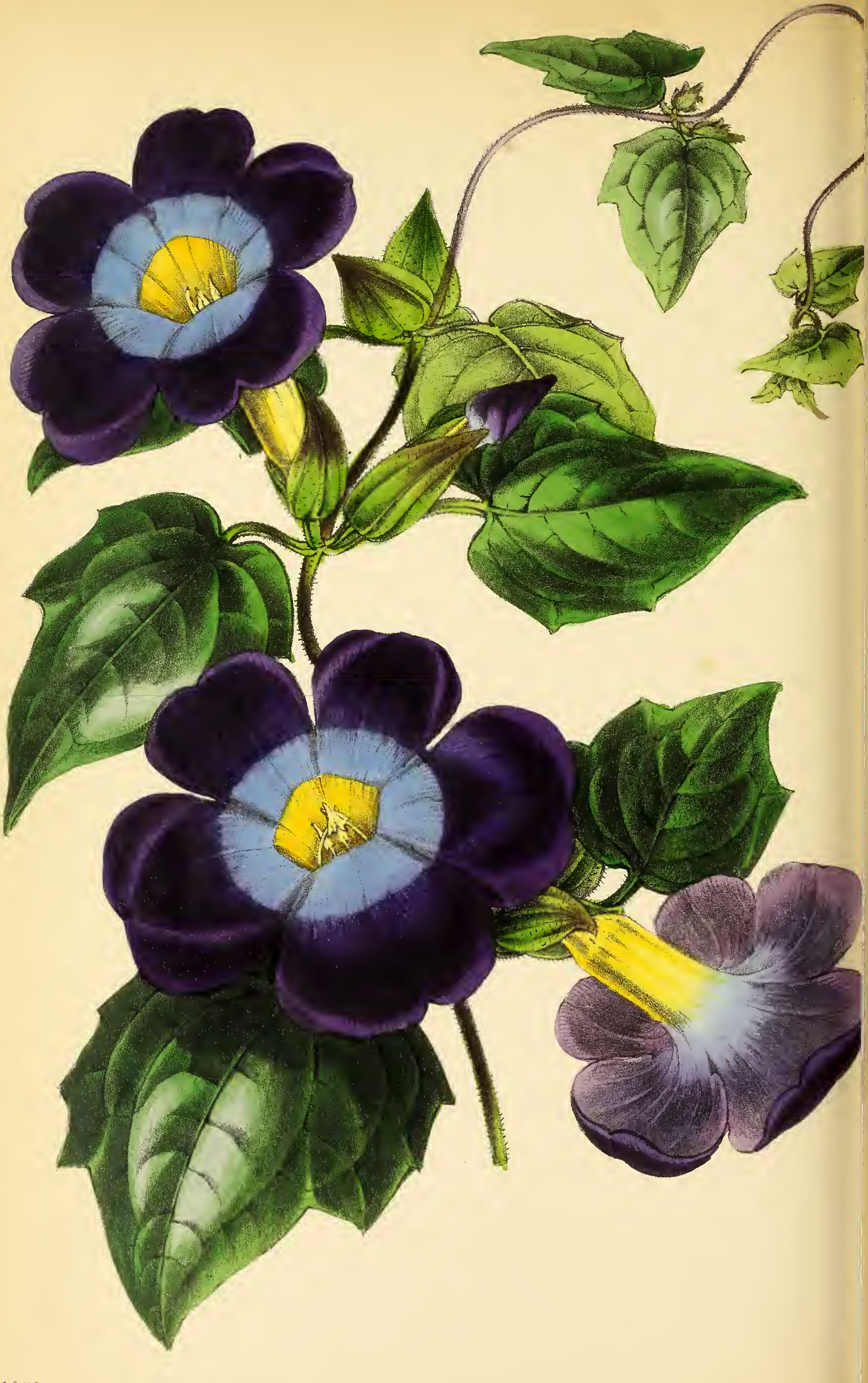
It is a native of the eastern coast of New Holland, and was introduced to the gardens of this country about 1792, but was afterwards lost, and not re-introduced till 1813. Perhaps its scarcity at the present time is, in some measure, owing to the difficulty of propagating it from cuttings. A more certain way of obtaining young plants, is to layer the ripening shoots; but the best specimens are always produced from seeds, when they can be obtained.

To preserve that dwarfness which is so desirable in a limited collection, a medium-sized pot only must be used, and the plants should be closely and frequently pruned. For larger specimens, of course, more space must be allowed for the roots to spread, and the branches need not be pruned more than sufficient to keep them compact and bushy.

One of the most important things in its management, is to provide a suitable soil. Nothing ruins the health of plants more than the obstinate adherence to potting them in finely pulverized mould. By using roughly broken loam and peat they may be kept in a vigorous healthful condition, and for the larger specimens leaf-mould will be found a valuable ingredient.

Our drawing was obtained from a plant which flowered in one of Messrs. Rollissons' greenhouses at the Tooting Nursery, last April.

The generic name is formed from the two Greek words *platys* broad, and *lobos* a pod, and has been suggested by the broad legumes.



S.Holden del. & lith.

Thunbergia chrysops.

THUNBÉRGIA CHRỲSOPS.

(Golden-eyed Thunbergia.)

Class.
DIDYNAMIA.

Order.
ANGIOSPERMIA.

Natural Order.
ACANTHÀCEÆ.

GENERIC CHARACTER.—*Calyx* with two bracts at the base, short, cupola-shaped, truncate or many-toothed. *Corolla* hypogynous, campanulately funnel-shaped, inflated at the throat; limb five-cleft, spreading, almost equal. *Stamens* four, inserted within the tube of the corolla, didynamous. *Anthers* two-celled, lobes parallel, with tufts of ciliæ, or sometimes short awns at the base. *Ovary* two-celled; cells bi-ovulate. *Style* simple. *Stigma* funnel-shaped, transversely two-lipped. *Capsule* globose at the base, two-celled, with a narrow conical beak, two to four-seeded. *Seeds* globose, umbilicus bored, with a broad annular callose girdle. *Embryo* without albumen. *Cotyledons* leafy, conduplicate. *Radicle* very short, angular.

SPECIFIC CHARACTER.—*Plant* a climbing evergreen. *Stems* slender, herbaceous, slightly hairy. *Leaves* petiolate, cordate, acute, angularly-dentate at the margins, five or seven-nerved, wrinkled. *Petiole* compressedly-terete, without wings. *Peduncles* axillary, single-flowered, shorter than the petioles. *Bracteas* ovate, ciliated, appressed to the base of the flower. *Calyx* truncate. *Anthers* sagittate, the base of the lobes with pedicellate glands. *Style* filiform, bearded above. *Stigma* of two large leafy, yellow, plaited lobes.

CHARMING as most of the *Thunbergias* are, the superiority of the species now represented must at once be admitted by every beholder; for the beautiful variety of tint exhibited in its large blossoms, fully entitles it to the first rank in the genus.

It was discovered by Mr. Whitfield in the interior of Sierra Leone, who, as we learn from the Botanical Magazine, at considerable danger and risk, succeeded in securing specimens, which he brought safely to England, to the gardens of the Earl of Derby, at Knowsley Hall, near Prescot, Lancashire, from whence it has already been dispersed throughout many parts of the country, and now exists in most extensive nursery establishments in the kingdom.

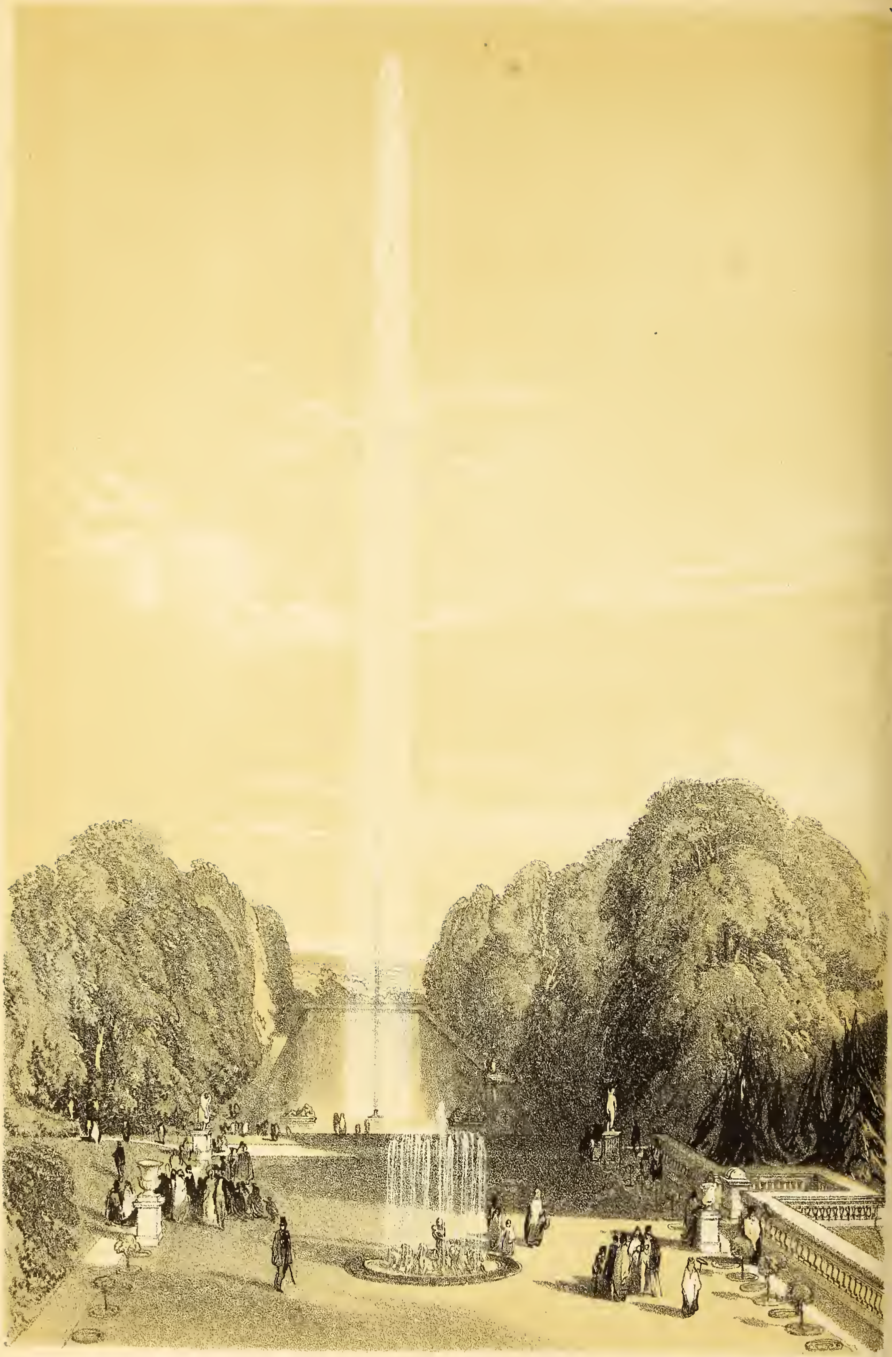
When supplied with a very warm and humid atmosphere and planted in a large pot, it grows very exuberantly, and will soon extend its shoots to many feet in length. But if kept in an airy, cool place, it loses its rambling climbing habit, and assumes more of the character of an ordinary erect growing shrub, and is less profuse of its flowers. In the Nursery of Mr. Knight, King's Road, Chelsea, the specimen from which our drawing was taken was placed over a tank, in a propagating house, and was, doubtless, greatly assisted by the degree of bottom-heat with which it was favoured, in forming the numerous flowers which appeared all along the shoots. No doubt a close pit or frame in which a little heat can be kept up, in conjunction with a uniformly moist air, will be the very best place for exciting it to the desired freedom of growth.

A rich soil, a well drained and roomy pot, together with copious waterings during active growth, are also conditions by which success is greatly influenced. And to ward off the pestiferous attacks of the red spider, which determinedly infest all this tribe of plants whenever attention loiters, the syringe should be frequently brought into requisition, applying the water well to the under surface of the leaves.

Cuttings take root with the most perfect readiness; and by their removal confer an immense advantage on young plants, particularly when large specimens are wanted; for an increased number of shoots will be produced, and what is lost in time by retarding the blooming of the plant, will be gained in ultimate effect. A reference to the various articles which have appeared in this Magazine from time to time, will afford a diversity of modes of training, which will enable the culturist to evade the miserable monotony of constantly adhering to an unvarying standard, and create additional interest even in this naturally engaging plant.

The bright *golden eye* in the centre of the flower, surrounded by a field of blue and violet, being the most striking feature of the species, has been very aptly chosen as the foundation of the distinguishing specific term.

This plant being one of the most showy of modern introductions, we may mention that it now exists in most of the great nurseries of London, and some of the provinces. Mr. Skirving, of Liverpool, having had it presented to him by the Earl of Derby, has a large stock of it.



On Stone by J. C. Bourne.

THE EMPEROR FOUNTAIN

CHATSWORTH

THE EMPEROR FOUNTAIN AT CHATSWORTH.

His Grace the Duke of Devonshire had for many years in contemplation the erection of an extensive fountain, which should at once surpass anything that had been previously done; and being favoured by the natural advantages of the place, a survey of the ground was commenced in December last, and the different levels taken under the direction of Mr. Paxton, to whom the whole management of the works was committed.

As this monster fountain is one of the wonders of the day, some details, and other matters, relative to its formation, &c., may not be out of place.

Although Chatsworth is well supplied with water, it nevertheless became necessary to have an additional supply that should be constant; and for this purpose a new reservoir was made behind the "Stand," and a conduit cut to convey the water to it from the Chesterfield road.

Much consideration was given to the nature of the pipes which were to convey the water from the reservoir, down the sloping hill, to the fountain, in order that, while security and strength might be obtained on the one hand, no unnecessary waste of metal might be occasioned on the other. Various hydraulic and pneumatic experiments were made, so as to arrive at a proper conclusion on this important part of the business. The results (which may be gathered from the sequel) appeared so perfectly satisfactory to Mr. Paxton, that he at once fixed upon the various forms and dimensions; but in order to strengthen his own opinions, he consulted the most eminent engineers of the country, and found that the elaborate calculations of scientific men fully confirmed his original ideas: the work was accordingly commenced.

A drain, or conduit, was cut from the Chesterfield road to the reservoir, winding round the hill in serpentine forms to find its proper level. This drain commences at the Humberley Brook, near one of the bridges on the above-named road, and is increased by tributary springs from the moors, passing along with a gentle fall to the reservoir: the drain is 2½ miles long. The reservoir covers a space of 8 acres, and its average depth is about 7 feet; its greatest depth at the head being 13 feet, where there is a solid mass of masonry, with a drop-valve to let the water off and on, and a waste-pipe and valve for the surplus water.

The first length of piping on the top of the hill, where the ground is comparatively level, is 270 feet, 15 in. bore, and ¾ in. metal.

The middle length is 1386 feet, 15 in. bore, and 1 in. metal.

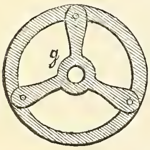
The lower length is 959 feet, 15 in. bore, and 1¼ in. metal; making in all a length of 2621 feet, or 873 yards 2 feet.

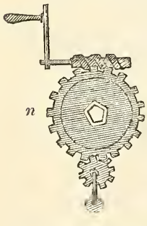
At 181 feet from the fountain, there is a double-acting valve (a beautiful piece of mechanism, made by Messrs. Bury and Kennedy, of Liverpool), which takes about five minutes to fairly open or shut, so that the whole may never be let on or off with a shock to the pipes. For a short distance from the fountain the pipe is $1\frac{1}{2}$ in. thick in metal, and is secured by a saddle-plate and bracket (cast solid to the pipe), firmly bolted to a mass of masonry. The end of the large pipe turns up with an elbow, and terminates with a flange, to which the flange of the tapering part is fixed. This tapering or conical part is about seven feet high, and is crowned by a brass nozzle. All the joints (with the exception of a few that were necessarily flange joints) are turned and bored, with clip sockets round each for additional security. There are also bands cast to the pipes for the same purpose, 3 in. by $\frac{3}{8}$, at every yard distant ; the number of joints is 298.

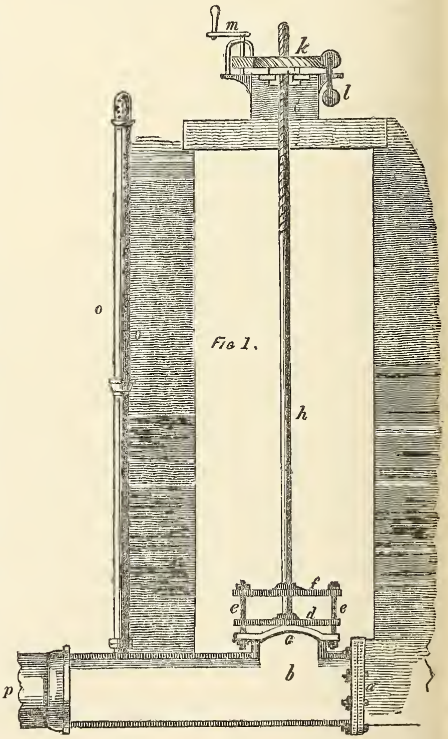
These things will be better understood from the following figures, which will illustrate the different parts of the fountain pipe, and the apparatus used for letting the water off and on, together with the conical pipe and nozzle from which the water issues. The scale of figs. 1, 2, 3, 4, is $\frac{1}{3}$ in. to a foot. Fig. 5, and the sections *n* and *g*, with fig. 1, are $\frac{1}{4}$ of an inch to a foot.

At the lower end of the reservoir there is a mass of masonry as before noticed, with beams and floor for supporting and working the drop-valve, or apparatus for letting the water on and taking it off.

Figure 1 represents this apparatus. The end of the conducting pipe finishes in the pond with a double flange, *a*, abutting against the masonry. Near the end of the pipe there is an upright piece of pipe, *b*, that admits the water, having a flange to which a circular brass seating is fixed. The inside of this seating is bevelled at an angle of 45°, and the brass valve, *c*, is bevelled to the same angle : they are both turned to a nicety, to make them fit close. The steading collar, *d*, moves up and down with the valve on the rods, *e e*, which are attached to the fixing plate, *f*. A plan of these is shown at *g*. The valve rod, *h*, has a screw at the top, working in a brass female screw attached to the beam *i*. This female screw is moveable in its brass seatings by the wheel *k*, attached to it. The handle of the horizontal movement, *l*, which has a spiral wheel working in the spur wheel, turns the water on ; while the handle,







m, attached to a cog, shuts the water off. The plan of these movements is shown at *n*. In the figure, *o* is an air-pipe with a rose head and 3 inches in the bore; and *p* is a continuation of the supply pipe, with the turned and bored joint.

Figure 2 is a part of the pipe, showing the joint-sockets. All the joints (except where flanges were absolutely necessary) are turned and bored; and each of these have joint-sockets, for the purpose of extra strength. In this figure, *a*, *a*, are the sockets, each in two pieces; *b*, *b*, the flanges by which they are put together; and *c*, the turned and bored joint. These sockets are well caulked with rope-yarn, and lead run in.

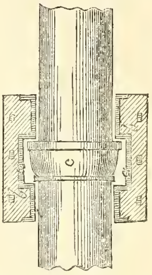


FIG. II.

Figure 3 is the double-acting, conical drop valve, at 181 feet distance from the fountain before noticed. The mechanism of this valve is on the same principle as the other just described; but the double action divides the current of water, and this with the slow motion prevents any sudden shock to the pipes. The valves *a*, *a*, are of brass, 12 in. in diameter, and drop into brass seatings; and the passages for the divided current, *b*, *b*, are together of the same capacity as the pipe. The motion of the handle, *c* (which is on the top of a neat fluted pillar), is communicated by the rod, *d*, to the cog, *e*, which works in the wheel, *f*; the latter being attached to the brass female screw, which raises the valve-rod, *h*, and lifts the valves. The arrows show the direction in which the water enters and leaves the valve. In consequence of the immense force of the water, it became necessary to have the lower end of the pipes well secured; therefore the lower end to which the funnel part is attached, has been cast with a bed-plate and bracket.

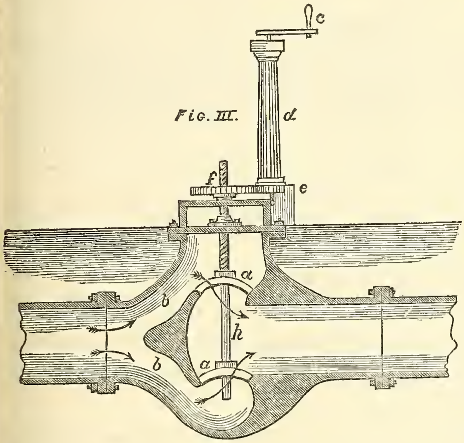


FIG. III.

Figure 4 represents this part of the pipe in which *a*, *a*, *a*, are three heavy blocks of masonry, to which the bed-plate (2 in. thick) is firmly bolted and batted with lead, as shown. In this figure, *b* is the bracket; *c*, *c*, the strengthening bands; *d*, a diminished piece of pipe to 12 ins. in the bore; *e*, the conical or funnel-pipe, with flanges at the top, to which the flanges of the brass nozzle, *f*, are bolted. There are various nozzles of 2, 2½, 3, 3½, and 4 in. diameter in the bore, with funnels to suit each. The water-line is shown at *g*. The height from the bed-plate to *h*, is 2 ft. 6 in.; from *h* to *i*, 1 ft. 6 in.; and from *i* to *k*, 4 ft. 8 in. The height of the brass nozzle is 5½ in. The whole of this end of the pipe is buried in masonry to within a few inches of the surface of the water.

Figure 5 is a different form of upright pipe, which, by its flanges, may be attached to the flange *i*, *figure* 4, when a different form of jet is wanted. This form will be a hollow cylinder, made by the inverted cone shown in the section. The outlet for the water will form a hollow ring, half an inch wide. In this figure the height from *a* to *b*, is 4 ft. 4 in., and from *b* to *c*, 2 ft. and $\frac{3}{4}$ of an inch. The brass nozzle is $5\frac{1}{2}$ inches. The cylinder is 12 in. in the bore, and the metal $1\frac{1}{2}$ in. thick. The inverted cone is solid from its bearings to the tapering point.

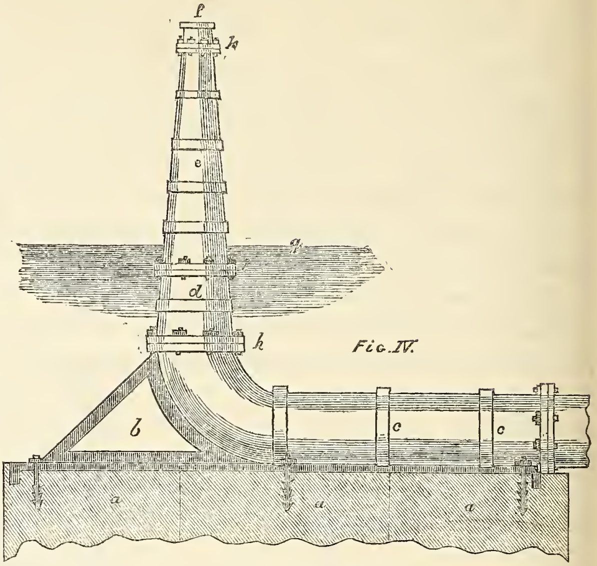
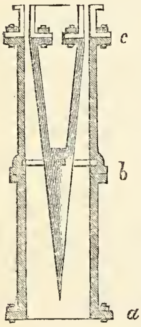


Fig. IV.

Fig V.



Different funnels and nozzles will be used, in order to give variety to the form of the water jet.

The whole fall of the pipe, from the pond or reservoir to the fountain, is 381 feet, but it is not of a uniform declivity. For the first 450 feet it is about 1 in 40; for the next 200 feet it is very great—nearly 1 in 2; the next 800 feet falls about 1 in 5; and the remaining part 1 in 9.

Upwards of 100,000 cubic yards of soil have been removed in making the conduit, reservoir, and track for pipe; the latter being in some parts cut out of the solid rock to a depth of 14 or 15 feet: the piping likewise crosses two ponds. The weight of metal in the pipes (which have been supplied by Mr. Barrow, of Stavely,) is about 217 tons.

The Emperor fountain plays to a height of 267 feet. The fountain which has been known to attain the greatest height, previous to that at Chatsworth, was one at Wilhelm's-hœhe, in Hesse Cassel; but it never attained a greater altitude than 190 feet, and is now out of order. The next is the fountain at St. Cloud, which plays to a height of 160 feet. The fountain at Peterhoff, in Russia, plays 120 feet high. The old large fountain at Chatsworth plays 94 feet high; and the fountain at Versailles to a height of 90 feet. The *great* fountain at Chatsworth is expected to attain the height of 280 feet! when the reservoir is quite full; then the depth of water at the head will be 13 feet, while its greatest depth at present has only been 2 feet 6 inches.

When His Imperial Majesty the Emperor of Russia visited this country, the works were not completed; but additional hands were immediately employed (working night and day), so that by temporary means the great fountain might be played before His Majesty, had he visited Chatsworth. His Majesty did not visit Chatsworth; but the great fountain has been named "The Emperor," in honour of His Majesty's visit to England. When it was known that the Emperor did not intend visiting Chatsworth, the workmen laid aside the temporary matter, and immediately brought to a close this extensive work, the formation and completion of which has occupied but little more than half a year.

Several improvements have recently been made in the other fountains at Chatsworth. The "Sea-horse pond" has been provided with a beautiful new fountain, where nine jets may be played at once, the centre jet rising above the others, and the whole forming an elegant figure. On either side of the *great* fountain there are fan fountains, which discharge the water in a singular manner. The west front fountain has been improved by tazzas, and double-acting supply pipes—one pipe being within the other, supplied from different sources. The "sea gods" have also been improved by water-pipes.

There has, within a short period, been laid down at Chatsworth for the purpose of fountains, piping of various sizes to the extent of 6,200 feet in length!

GARDENING AS A SCIENCE.

VEGETABLE PHYSIOLOGY.—No. X.

The organic structure of plants, the functions of the several organs, and the chemical components of vegetable products, have been traced in our former articles; and it now remains to direct attention to the Philosophy of Nutrition—a subject which has been involved in much perplexity, and still admits of great difference of opinion.

It is our intention to make it appear that great light has been obtained by the discoveries of modern chemists; and to effect this object, we must adduce various authorities which bear upon the inquiry, and compare them with the opinions formerly entertained, and with the real facts resulting from actual observation.

As plants of all descriptions are connected with the ground by their roots (and in this general assertion we include also those cultivated in pots), it was naturally inferred that they derived their nourishment entirely from the soil; and this, with the more apparent reason, since it was self-evident that the destruction of the roots implied that of the entire plant. But that this opinion was too hastily formed, and without sufficient observation, has been clearly shown by several philosophers, among whom the great Liebig stands pre-eminent. He has demonstrated the truth of that which the experience of every observant gardener must also have confirmed —namely, that *plants, so far from exhausting a soil, add manuring matter to it.* To prove this let us go back to first principles, and inquire—what is *earth?*

Loam is a term of familiar occurrence, though it admits of so many variations as scarcely to be intelligible. However, we may safely assume that when a large proportion of siliceous sand is naturally united with a less proportion of pure clay or alumine, and with certain small quantities of chalk and oxide of iron, the earth resulting from such a combination is, strictly speaking, a *loam.* But what is the origin of such an earth, and whence was it derived? To this inquiry we safely answer that—*the formation* of every particle of laborable earth which now covers the surface of the globe is a process of the disintegration of rocks. On this great primitive operation of natural chemistry, Davy thus expressed himself in his fourth lecture addressed to the late board of agriculture.

"It is easy to form an idea of the manner in which rocks are converted into soils, by referring to the instance of soft granite, or porcelain granite. This substance consists of three ingredients, viz., quartz, feldspar, and mica. The quartz is almost pure siliceous earth, in a crystalline form. The feldspar and mica are very compounded substances; both contain silica, alumina, and oxide of iron: in the feldspar there is usually lime and potassa; in the mica, lime and magnesia."

In this short passage—which, thirty years ago, was scarcely listened to by the agricultural body — we now find the base, the substance, of all the modern acknowledged theory; and in it we obtain the key to the true philosophy of horticulture. In quartz or rock crystal, we have the origin of sand—a substance which breaks up and modifies the texture of loam, yet in itself is perfectly, or all but, insoluble; *silica* is an oxide of crystal or pure flint. *Alumina*—pure clay and oxide of iron, are also insoluble substances; the former confers tenacity on sandy loams, and renders them plastic; the latter gives colour in all its shades, from pale buff to deep ochreous red. *Lime*, as it exists in earth, is found combined with carbonic acid, and then is neither more nor less than insoluble chalk. As, therefore, the earthy ingredients of loams are portions of rocks broken up by natural agents, no particle of them in their pure state can contribute by any possibility to the organic structure of a vegetable. But the case is widely different when we discover potash among the ingredients of the disintegrated rocks; for in it we discover the base of all those combinations with vegetable acids which are formed in the cellular tissue of a great variety of plants most valuable to man and animals. *Potash* also is a solvent of silica, and by its agency that otherwise intractable substance is conveyed into the structure of the cereal grasses, and of a variety of other plants. "When," Davy adds, "a granitic rock of this kind" (soft granite containing quartz, feldspar, and mica,) "has been long exposed to the influence of air and water, the *lime* and the *potassa* contained in its constituent parts are acted upon by water or carbonic acid, and the oxide of iron, which is almost always in its least oxidised state, tends to combine with more oxygen; and the consequence is, that the feldspar decomposes, and likewise the mica; but the first the most rapidly. The feldspar, which is as it were the cement of the stone, *forms a fine clay;* and the mica, partially decomposed, mixes with it as sand: the undecomposed quartz appears as gravel, or sand of different degrees of fineness."

Although it is impossible to enter into any particular details of such operations conducted in the vast laboratory of nature, yet in the foregoing statement we find general truths: these were fully appreciated by Liebig; for we read in his preface, that "since the immortal author of the 'Agricultural Chemistry,' no chemist has occupied himself in studying the applications of chemical principles to the growth of vegetables, and to organic processes. I have," he adds, "endeavoured to follow the path marked out by Sir Humphry Davy, who based his conclusions only on that which was capable of inquiry and proof."

Heretofore we find almost all writers attempting to prove that plants derived their support from watery solutions of putrescent — *i. e.* of decomposable, matters contained in the ground, and conveyed through the roots into the organic structure. But Liebig—seizing the facts elicited by his great predecessor, examined by repeated and minute experiments the products of vegetables that had been submitted to the action of fire, and thence infers, that—"trustworthy examinations of the ashes of plants of the same kind, growing upon different soils, would be of the greatest importance to vegetable physiology,"—and so it has happened;—for now, instead of insisting any longer upon the old theory, we find all our best practical writers devoting their attention to the *inorganic* constituents of plants, which constituents are traceable in the ashes left after incineration. By these inquiries we arrive at a simple and determinate system of manuring, and are enabled to reconcile apparent inconsistencies, for they instruct us that no substances whatsoever can enter the plant through the infinitely minute tissue of the roots, excepting those which are absolutely soluble in the water of the soil, and such substances are potash, certain combinations of phosphoric acids, neutral salts, and electro-chemical combinations of *carbon;*—but to recur to Davy. "As soon as the smallest layer of earth is formed on the surface of a rock, the seeds of lichens, mosses, and other imperfect vegetables which are constantly floating in the atmosphere, and which have made it their resting-place, begin to vegetate; their death, decomposition, and decay, afford a certain quantity of organisable matter, which mixes with the earthy materials of the rock; in this improved soil more perfect plants are capable of subsisting; these, in their turn, absorb nutriment from water and the atmosphere, and after perishing afford new materials to those already provided; the decomposition of the rock still continues, and at length, by slow and gradual processes, a soil is formed in which even forest trees can fix their roots, and which is fitted to reward the labour of the cultivator."

It has always been supposed that the decay of vegetable matter within the soil was the precursor of vegetable nutriment; in a word, that it prepared the crude sap, and contained all the elements of the vegetable structure. It has, however, been the glory of modern science to prove that not a particle of decaying matter is taken from the soil: on the contrary, that vegetable substances—*humus* and the *base of carbon*, are constantly added to, and accumulated in, ground under crop.

A writer, (Dr. Fownes,) author of the Prize Essay on the Food of Plants—in the Journal of the Royal Agricultural Society—thus expresses himself: the quotation is substantially the theory of Liebig:—

" Examine the soil in which trees grow from year to year," (as, for instance, in a pine forest of barren sand, like that of the Landes of Bordeaux,) " and note its constantly *increasing richness* in *humus* — in vegetable matter. Far from exhausting the soil in this respect, these trees pour out constantly from their rootlets matter containing carbon, which, by decay in the soil, becomes humus. The dead leaves, and small branches accidentally broken by the wind, accumulate beneath and add to this store of humus"—" whence did these trees obtain their carbon ? The earth did not yield it : it must have been the air.

" To ascribe the origin of the carbon of plants in a state of nature to the absorption of humus from the soil in which they grow, is about as reasonable as to suppose the possibility of a race of animals subsisting on their own *offspring.* That substance is *a product* of *the decay* of *previously existing plants*, and which must have got their carbon from some other source. Its quantity, moreover, increases every year; and if this latter fact is not true with respect to some cultivated soils, it is easy to see the reason in the greatly accelerated destruction of the substance by the oxygen of the air, brought about by the constant loosening of the soil; add to this the slight degree of solubility possessed by humus itself, or of the so-called ' humate of lime,' and it is easy to see its total inadequacy to supply even a small part of the carbon fixed in a growing plant."

Enough of quotation to prove the advance of science; but our authorities yet lack an active operating first cause; they neglect, or do not perceive, the boundless energy of the elementary fluid, termed electricity, the bond of all chemical union—the agent of all attraction, and of gravitation itself. We shall show this more clearly in our closing article on Manures: but in our present position it may suffice to state that the crude sap contains all those substances which are directly soluble in water—that is to say, the salts of all kinds which are found, either simple or compounded, with acids, having alkaline or earthy bases.

Carbon can only enter the roots in the form of carbonic acid, or of some hydrocarbon; but as these combinations are always gaseous—the direct result of electric divellent agencies—we incline to believe that they pass off into the atmosphere and then enter (according to the nature and wants of the individual plant) the stomates of the leaves.

In proof—to some extent at least—that vegetables derive their bulk through the medium of the leaves, let the gardener consider the structure of the plants of the cucumber and melon tribes, of common chickweed, of Tropæolum tricolor, &c. &c., and view the increasing bulk of stem, the boundless development of foliage, in a word, the vast accumulated mass of vegetable substance when compared with the mere *thread* of stem near the root: can it be deemed possible that through a channel so attenuated, matter so voluminous could have been conveyed? But view the expansive leaves, and discover the infinite number of pores prepared to *drink the air*, and then, though admiration may be exalted, the simplicity of the organs of supply will, in proportion, be evident. The doctrine of the sap has hitherto been surrounded with mystery, but by the discoveries and application of modern chemistry, and the application of instruments to the ends designed, the perfect assimilation of the constituents of vegetable nutriment has been rendered, as it were, self-evident.

We are not for one moment inclined to dispute the utility of manures, that is, of all those decomposable matters which the gardener mixes with his soils; the only point of contention is this—and we put it in the form of a question—Is there a single fact within the experience of the most observant cultivator, which tends to show, that one particle of colouring matter (and this a solution of manure would exhibit) ever entered the absorbent organs of the roots?

METHOD OF TREATING LUCULIA GRATISSIMA.

It is somewhat singular that a plant of such superior excellence as this, both in the magnificence of its large clusters of delicate pink flowers, the period of their development, and the delicious perfume they constantly exhale, should still remain, after having been in the country so many years, a comparatively scarce species. Nurseries, nevertheless, are annually drained of their young stock; and, though it is not increased with the rapidity and ease of some plants, it is far from being a difficult plant to propagate. It may be well, then, to inquire whence this scarcity comes, and also to add a few hints, culled from the practice of some of the most successful cultivators.

Naturally, the species is of luxuriant growth, making a few shoots, which grow to a great length, and, consequently, it is not by any means a bushy plant. After it has flowered, or, indeed, before the flowers are well fallen, these branches produce several shoots near the apex, all the lower buds remaining dormant; and hence the plant is left bare of leaves and shoots, for, perhaps, more than half its height. And, if this is continued for two or three years, the growing powers of the plant are impaired, owing to the large quantity of useless old wood that consumes the sap necessary to support new growths. From this many cultivators have concluded that, to have good specimens, a fresh stock of young plants is necessary every year, and on that supposition have discarded the old ones.

Now, although it is undoubtedly highly desirable to have a number of young plants to flower as dwarf specimens, it is quite as much, if not more desirable, to have large bushy specimens furnished with branches to the surface of the pots; and this can only be done by preserving the old plants.

The great error in their management is the fear of using the knife freely. It is only by pruning, and severe pruning, that the naturally straggling character of the old plants can be overcome, and reduced to the desired bushiness. Instead of allowing the uppermost buds on the preceding summer's growth to furnish the shoots for the succeeding season, the old branches should be cut away to within an inch or two of their base. Thus, two or three, or perhaps four branches, will be obtained from each near the point from which only one or two sprang the preceding year; consequently, the number of shoots will be yearly increasing, and instead of becoming naked at the base, and of a scattered growth, the bushiness will be continually augmented.

This character, however, may be carried to excess, even with the *Luculia;* for if too many shoots are permitted to form, they will prevent one another from acquiring that degree of vigour which is necessary to produce a good head of bloom. Besides, the large size of the foliage demands a proportionate space for their exposure to light, and, if they are crowded, the loss of the interior and lower ones will be the inevitable result.

Another error which necessarily ensues from permitting the uppermost buds to remain, is, that as they have mostly begun to grow before the flowers are withered, the plants are deprived of their season of repose, and kept in a continual state of excitement. But, when pruned back to the lower buds, they may be placed in a cool place, and left without any water till the beginning or middle of February.

Sometimes before they are again excited, a quantity of the earth should be shaken out from the roots, and fresh compost supplied. A rich loam, full of decaying vegetable fibre, and a third part of leaf-mould, makes an excellent mixture for them. When *good* peat can be easily procured, a portion may be added, but it is by no means indispensable.

A great mistake is committed by putting in heat immediately after they are potted. It is quite necessary to leave them a week or two in a cool place, that the buds may acquire additional vigour, and the plant be storing up sap to feed them when they are once more wanted to grow. Moreover, some of the roots will certainly be damaged in clearing them of the old earth and repotting, and if the plants are removed too suddenly to a high temperature, the buds will begin growing before the roots are in a condition to convey a sufficiency of nourishment to support them.

A pit, where a temperature of from 60° to 70° can be maintained—according to the external weather and the advancement of the season, together with a proportionate humidity, is far preferable to a house during the first stages of growth. A rather liberal supply of water will be needful, and a gentle circulation of air. As the season advances towards midsummer, more and more air must be given, and the sun must never be allowed to shine fully upon them, as it is injurious to the young and tender foliage. After the middle of July a pit is no longer necessary, and the plants will be benefited by being removed to the shade of a north wall, where they can also be sheltered from strong winds. Here they may be permitted to remain till the beginning of September, by which time every branch will be crowned with a tuft of flower-buds, and they will need no other heat to develop them than what is afforded by a close pit. Indeed, it is a very pernicious practice to give them much heat, for the flowers will be larger, and stronger, and better coloured, as well as able to last for a longer period, if slowly and steadily brought on till they expand; and, moreover, the leaves will have time to gain a fuller green.

It will be seen, then, by the foregoing observations, that the ordinary method of growing them in a stove is far from being the most appropriate. The plants are by that method rendered so tender, that they will frequently scarcely endure the temperature of the greenhouse whilst in flower. Another evil is, that whilst the flowers are inferior, the length of the stems is increased to a weakening degree. The resources of the plants are thus drawn upon in an increased ratio to furnish nourishment to that, which, so far from being an improvement to the appearance of the specimens, is decidedly a detraction from their beauty, and at the same time an injury to their constitution.

The main reason for giving them a situation, when they are removed from the pit, where they may be continually shaded from the sun, is because a full exposure robs the leaves of their bright green colour. They will, nevertheless, in spite of this precaution, though to a less extent, assume a reddish tinge, but after they are returned to the pit, they will have time to recover their green hue before the lowers open.

While these remarks, however, exhibit the essential elements of good culture, n reference to small specimens, the *Luculia* must not be considered unsusceptible of being grown to a large size, in proper conditions. Like the *Hydrangea*, it will become an ugly object when allowed to grow more than two feet high, if it be not frequently pruned. But, when pruning is regularly practised, it can be made to reach the height of five or six feet, and yet retain an ornamental character. Indeed, a good specimen of this height is a most magnificent thing while the lowers are open.

To cultivate the *Luculia* to any size, it wants planting in the bed or border of a conservatory, where it will be sufficiently shaded to prevent the sun beating iercely upon its leaves, and yet not altogether deprived of a large amount of ndirect light. It should also be put where a current of cold air can never play round it, and then, provided it be planted in generous soil, well drained, and yet capable of being kept moist enough to maintain a rather damp atmosphere around the plant, it will flourish with a luxuriance which is seldom witnessed, and bloom in a very splendid manner.

After two or three years' growth in the same soil, under conservatory treatment, a mulching of well-pulverized manure will be of the greatest assistance to the plant, and this should be liberally continued in every subsequent season. Wood ashes or charcoal would be an excellent thing to mix with the compost in which it is placed, whether in a pot or a border; and broken stone might be substituted when they cannot be obtained. The species, being peculiarly liable to suffer from over-watering, or from standing water, some such appliance to draining is particularly desirable. The charcoal and ashes would likewise be useful in a nutritive point of view.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR OCTOBER.

BIGNO'NIA CAROLI'NÆ. "All that we know of this charming plant," writes Dr. Lindley, "is, that it flowered with the Earl of Ilchester, at Melbury, in 1842, at which time we were favoured with specimens; and that it again blossomed with his Lordship, in great abundance, in May, 1844. It is a most desirable plant for conservatories, because, in addition to the beauty of its snow-white flowers, which the plant pours forth with exuberant luxuriance, they are sweet-scented; an unusual circumstance with *Bignonias*. We presume it to be a Buenos Ayres species." It is a graceful plant, with somewhat pubescent conjugate foliage, the leaflets of which are heart-shaped, tapering at the end into a long point. The flowers are arranged rather loosely in terminal panicles. "All such plants being very subject to red spider, require syringing once or twice a day during the summer months. They may be propagated by cuttings in the usual way." *Bot. Reg.* 54.

CHABRÆ'A RUNCINA'TA. A Syngenesious plant, with weak, branching herbaceous stems, a foot or eighteen inches long, furnished with oblong, variously pinnatifid leaves, partially clasping the stem, at the base. The flowering branches have the character of a leafy panicle; the leaves at the base of each ramification gradually decreasing in size towards the top of the plant, and clasping the stem more decidedly than those below them. The flowers are loosely disposed, and about three-fourths of an inch across; when they first expand they are commonly white, but frequently change to a pale roseate tint. In placing this species in *Chabræa*, Sir William Hooker follows Professor De Candolle, though he is not satisfied that it is really distinct from *Leucheria*; and as it is apparently identical with the *L. runcinàta* of Dr. Gillies, he has retained his specific appellation as being preferable to that of De Candolle (*C. rosea*). It is a native of Chili, particularly on the Andes, and was raised in the Royal Botanic Gardens, Regent's Park, and probably in other collections, from seeds sent over by Mr. Bridges. The flowers are fragrant. De Candolle named the genus in memory of Dominicus Chaubrey, of Geneva, a writer who flourished about the middle of the seventeenth century. Most likely the plant will require the protection of a greenhouse or frame. *Bot. Mag.* 4116.

CRATŒ'GUS CRENULA'TA. "This plant is the Pyracantha of the Indian mountains, and rivals that of Caucasus in its rich scarlet berries, which are, however, of a peculiar vermilion tint, and of a very depressed figure. Their flavour, too, is by no means ungrateful. In fact, if it would bear our climate with certainty, it would be preferable to the Pyracantha itself, for its leaves have a remarkably glossy surface, and the plant is, in all respects, handsomer. The shrub is a native of Nepal, whence it was long since received by Dr. Roxburgh, who named it, and says that in the Calcutta garden it had grown to the height of from six to eight feet in eight years;

it would have been better for us if he had found it unkeepable. As it is we do not," Dr. Lindley says, "anticipate its hardiness in severe winters. In the gardens of the Horticultural Society it has survived several winters, trained against a south wall." Grafts or buds unite freely with the common Thorn, and this will most likely prove a better mode of increasing it than by sowing the seeds, and growing it upon its own roots. The seeds from which the plants in the Horticultural Society's Garden have sprung, were presented by Dr. Royle, from the North of India. The specimens in many collections, under this name, are not different from the common Pyracantha. *Bot. Reg.* 52.

Crypta'ndra sua'vis. The name of these little heath-like New Holland shrubs is given in consequence of the concealment of the anthers beneath the hooded petals, and is formed from the Greek words, *cryptos* hidden, and *aner* a male. They are "found on barren hills and rocky places, or in light sandy land. In a wild state they often become spiny; but in cultivation, when they are kept in a moist atmosphere, they much lose this tendency. In general their leaves are very small, like those of the plant now before us; but in *C. buxifolia,* which Allan Cunningham considered a *Pomadérris,* they acquire a tolerable size. Their flowers are always small." *C. suavis* was imported from the Swan River, and is a pretty little greenhouse shrub, producing all over the branches a profusion of diminutive white blossoms, which have a sweet scent, like those of the Hawthorn. It was raised from seeds by Mrs. Wray, of Cheltenham, with whom it flowered in January. It may be planted in a loamy peat, taking especial care that the pots are well drained. *Bot. Reg.* 56.

Dendro'bium compre'ssum. "This singular species was discovered in the Island of Ceylon by Mr. Nightingale, and by that gentleman sent to his Grace the Duke of Northumberland," in whose collection, at Syon, it flowered in August, 1842. "The year of its importation was 1840. The curious flattened stems are not more than three or four inches long, and resemble those of no species hitherto discovered. They appear, however, to bring the plant into a section of the genus to which the name *Dendrocaryne* (*cory'ne*, a club) may be applied, and which will also contain *D. densiflorum*, *tetragonum*, *Griffithiana*, and *Macræi*. The singular form of the labellum, which is that of a wedge drawn out at the point, and furrowed along the middle, distinguishes this plant, independently of its habit." The racemes spring from the nodular rings of the leafless stems, and are somewhat drooping, and commonly bear four or five yellow flowers. It may be grown in a pot, or attached to a block of wood, and, in common with most other Orchidacea, requires a warm, moist, shaded atmosphere whilst growing, and in the winter no more water than just sufficient to preserve the plant in a plump, unshrivelled condition. *Bot. Reg.* 53.

Echinoca'ctus conci'nnus. "This, so far as I can find," writes Sir W. J. Hooker, "has only a name in gardens and in catalogues. It does not appear in Pfeiffer's useful '*Enumeratio*', unless it be the *E. orthocanthus*, with the short description of which it seems to accord, except in not having the longer spine so stout and so straight as appears to be the case with that species. Nothing short of good figures can illustrate the various forms of this intricate family." The present species has been in the Kew Botanic Gardens for some years, and flowers in March and April. It is a globose plant, remarkably depressed at the top, and even displaying a slight convexity. On the border of this depression the flowers, two or three in number, are produced. These are large and handsome, composed of numerous spreading yellow petals, with a red streak down the centre, arranged in several rows, the interior space filled up with the numberless yellow stamens, amongst which the purple pointal is very prominent. *Bot. Mag.* 4115.

Epide'ndrum verruco'sum. "This beautiful and fragrant plant has been obtained from Mexico by Messrs. Loddiges, with whom it flowered in July last. Among all the *Encycliums* (that section of the genus characterised by a three-lobed labellum), not more than two or three are superior to it in attractiveness. It is not nearly related to any kinds hitherto discovered, belonging to the same set as *E. tessellatum* of Candolle, from all which its stems and flower stalks, closely covered with minute asperities, and its rich crimson pink or purple flowers, which are as much as three inches in diameter, readily distinguish it. Its closest affinity is, perhaps, with *E. phœniceum*, a native of Cuba, and *E. Hanburii;* but both those plants have the middle division of the lip two-lobed; and they are not, that we are aware of, fragrant." (This species was noticed at page 189 of the present volume.) *Bot. Reg.* 51.

HABROTHA'MNUS PURPU'REUS. Dr. Lindley has cancelled the specific name, *elegans*, given in the August number of the *Bot. Reg.* t. 43, and substituted the present.

JUANULLO'A PARASI'TICA. "It will surprise many of our readers, perhaps," says the editor of the Botanical Magazine, "to be told that this fine plant, known in our stoves, we believe, for four or five years, and pretty widely dispersed under the name of *Brugmánsia parviflora* and *B. floribunda*, has nothing to do with that genus; and is, in fact, one of the rarest of plants, (speaking botanically,) a genus spoken of by authors as 'only known to Ruiz and Pavon.' A reference to the figure in the Flora Peruviana of *Juanulloa parasitica* will convince any one that the so-called Brugmansia can be no other than that remarkable 'parasite (or rather, I apprehend, an epiphyte) upon the trunks of trees in woods, near Pozuzo and San Antonio de Playa Grande, in Peru.' It was there discovered by the authors of that fine work, and well figured by them. Notwithstanding its parasitic nature, it flourishes freely if planted in earth, if kept in a moist and warm stove, and recommends itself both by its handsome foliage and its large and richly-coloured calyces." *Bot. Mag.* 4118.

OSBE'CKIA STELLA'TA, *var.* "Of this fine plant, seldom seen now in our gardens, there are two very distinct varieties. Of these one has the curious fringed scales with which the calyx is coated, so closely arranged that the whole surface is covered over with a mat of entangled bristles. The other has a narrower calyx, and the scales stand more widely apart, so as to show its sides between them." This latter flowered last September, in the garden of Henry Thomas Hope, Esq., of the Deep-dene, near Dorking, where it is treated as a greenhouse shrub. "The species is found in Nepal, where it seems to be common. Dr. Royle mentions it as one of those Melastomaceous plants which advance farthest to the north, in the valleys near Massooree, and on the banks of the Giree river." *Bot. Reg.* 55.

PTERODI'SCUS SPECIO'SA. "For a knowledge of this splendid new genus of plants the Botanical world is indebted to the Right Honourable the Earl of Derby. It was collected at Macalisberg, by Mr. Burke, (now employed on a similar mission in North-West America, and in California,) while engaged in procuring animals and plants for that distinguished nobleman, in the interior of South Africa. It flowered in the stove, at Knowsley, in May, 1844, and rarely has a more desirable plant been introduced to our collections." *Bot. Mag.* 4117.

NEW OR INTERESTING PLANTS RECENTLY FLOWERED IN THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

ALLAMA'NDA GRANDIFLO'RA. We have recently observed plants under this name of a new and exceedingly showy species of *Allamánda*, in several of the nurseries and private collections in the neighbourhood of London. Although it bears considerable resemblance to *A. cathartica* it is nevertheless very different in several important features. In that plant, now so deservedly admired, since more attention has been paid to its culture, the stems are strong, and of a decided scandent habit, and the leaves are broad, and commonly arranged on the stem at short intervals in whorls of four. The present, however, is of a more bushy nature; the stems are considerably less robust, and the leaves proportionately smaller, and disposed three in a whorl. There is also a trifling dissimilarity in the form of the leaves, which have a greater number of lateral veins, and, as well as the midrib, are densely pilose; whilst, in the other species, the main nerve only is hairy. The flowers, also, instead of appearing either from the side or end, are always borne at the extremity of the shoots, and are there collected into clusters of from three to five. As the name indicates, they are very large—usually four inches, and not unfrequently as much as four inches and a half in diameter. A fine large bush, with numerous shoots, each bearing a cluster of blossoms which partially weigh them down, imparting a pleasing curvature, has been flowering for some time in the gardens of Col. Baker, under the superintendence of Mr. Dodds. It is a Brazilian species, and requires a stove or warm pit.

APHELA'NDRA CRISTA'TA. Fine plants of this West Indian shrub are rarely seen, and yet it has been above a century in the country, and is a most splendid thing when well-managed, as is fully evidenced by a noble plant now flowering at Mrs. Lawrence's, of Ealing Park. This specimen is about six feet high, and has made shoots during the late summer from four to five feet in length, furnished with fine broad leaves, some of them fully ten inches long, and crowned with large compound spikes of the rich scarlet blossoms, disposed in cruciform pyramids. A warm and humid atmosphere is requisite to succeed in growing it, and after it has done flowering, the shoots should be well pruned back, to keep it bushy.

Aru'ndina bambusifo'lia. Messrs. Loddiges have recently flowered a specimen of this species received from India in 1839. It is an elegant Orchidaceous plant, with numerous long slender stems, growing two feet high, and probably more, clothed with narrow bright-green grass-like leaves. The flowers are of a medium size, and are supported on a scape issuing from the end of the shoots. The petals are twice the breadth of the sepals, and both are of a soft pink hue. The lip overwraps the column at the base, and is indistinctly three-lobed ; the middle lobe being deeply notched at the end, somewhat undulated on the margin, and of a rich crimson-purple colour. It grows best in a well-drained pot filled with a fibrous peat, and placed in a warm house kept pretty moist during the growing season.

Catase'tum na'so. This is one of the handsomest species of this singular genus. It was received from Mr. Linden into the collection of Sigismund Rucker, Esq., of Wandsworth, where Mr. Mylam, the gardener, succeeded in flowering it last year for the first time, and the same specimen again produced blossoms about the middle of last month. The ground colour of the sepals and petals is not of that dingy green common to the majority of *Cataseta*, but very nearly approaches white, being only slightly tinged with a greenish-yellow : they are also numerously spotted with deep crimson. The helmet-shaped lip is of a very dark indescribable colour in the interior, and terminates in a long snout, forcibly reminding one of the head and trunk of an elephant. As the flowers are of a more lively colour than the rest of the genus, and their structure in every respect as curious, it is deserving of a place in the choicest collection of Orchidaceæ.

Chiro'nia floribu'nda. A pretty little plant, which ought to be in every greenhouse. It branches profusely from the base, forming a densely compact bush, about a foot high, and is almost continually studded over with purple flowers, which, though not very large, yet, from their abundance and bright shining appearance, impart a conspicuousness to it that renders it a very desirable species. It has been flowering for some time in the nursery of Mr. Jackson, of Kingston, and is evidently identical with one at Messrs. Rollisson's, of Tooting, called *C. Fischeri.*

Cœlogy'ne Cumi'ngii. A strong specimen of this deliciously scented species of *Cœlogyne* is flowering in one of Messrs. Loddiges' Orchidacea houses at the Hackney nursery. It has roundish pseudo-bulbs produced on a creeping rhizoma, and surmounted by a pair of rather broad, elliptic, lance-shaped, five-nerved leaves, between which the scape supporting the flowers ascends. The flowers are handsome, of a clear, unsullied white, with the exception of a portion of the lip, which is stained with orange and yellow, and has three parallel raised plates frilled on the top and tinged at the end with a dark brownish red. They yield a fragrance not unlike that of Hyacinths. It is a native of Sincapore, and was forwarded to Messrs. Loddiges by Mr. Cuming, in 1840. It should be grown in a basket, or on a block of wood, always observing to be careful that no water falls on the flowers, as it discolours and makes them decay much earlier than they would if kept perfectly dry. This, and other *Cœlogynes*, may be propagated by severing a portion of the older parts of the rhizoma with a pseudo-bulb, potting it in fibrous peat, allowing very little water till the buds from the base of the latter begin to swell and break.

Convo'lvulus Sibtho'rpii. In habit, this plant agrees with *C. althæoides*, and, like that species, will be a very interesting ornament to those piles of rock which frequently adjoin the parterre or the greenhouse, or for training round a wire trellis on a lawn. The characters of the species are perhaps more nearly those of *C. bryonifolia*, but it never attains the vigour and strength of that species. The leaves are broad and variously lobed, and sinuated on the margin. The flowers are something larger than those of the former species, of a rich and beautifully shaded pink hue, with a deep violet throat ; and being clustered together on axillary peduncles, and pretty freely produced, have a showy appearance. It needs the protection of a frame during winter. A specimen was in flower a short time ago, at Messrs. Henderson's Nursery, Pine-apple Place.

Diplade'nia crassino'da. The beautiful new stove-plant recently flowered at Mr. Loraine's, and known in nurseries and gardens as *Echites carassa*, under which name it was noticed at p. 213 of our last month's Number, is *E. crassinoda*, and belongs to that section of the genus which has been separated by De Candolle, and described under the name given above, which is founded on the Greek, *diplos* double, and *denia* a gland, in allusion to the glandular appendages at the nodes.

Fernande'zia lunife'ra. A native of Brazil, from whence it was imported in 1836. A specimen has recently blossomed in Messrs. Loddiges' collection at Hackney. It is a more robust growing species and has considerably larger blossoms than *F. elegans,* which it greatly resembles. The most distinct and prominent trait in which it differs from that species is in the falcate or crescent-shaped upright divisions of the lip, from which also it derives its specific name: in the other species these are very short and blunt. The colour is very similar, being a bright yellow with spots of crimson. It should be planted in fibrous, peaty earth, and kept warm and moist during the growing season; observing that water must on no account be permitted to stagnate round the root.

Griffi'nia hyaci'nthina. Few of the Amaryllis tribe are more lovely than this now old species. It is indeed one of the finest of autumn-flowering stove-bulbs. The leaves are broad, about eight or ten inches in length, and curiously latticed with small veins connecting the main nerves. The flowers are elevated on a short stout scape to a trifle higher than the leaves, and are disposed in a capitate cluster of ten or twelve. Their colour is a brilliant ultra-marine blue, centred with white. Flowers have been developed by plants in the possession of Mr. Jackson of Kingston. We have also seen a variety with much longer petals at Mrs. Maryatt's, of Wimbledon, and in the Nursery of Messrs. Rollisson's, Tooting.

Lœse'lia cocci'nea. Many different names have been assigned to this remarkably neat and handsome greenhouse shrub. It is generally known as *Hoitzia coccinea* or *H. Mexicana,* and has also been described by botanists as *Cantua Hoitzia,* and *C. coccinea.* So well is its merit appreciated even in its native country, that it is there admitted to ornament the gardens. It grows plentifully about Guanaxuato and in other parts of Mexico, and has been cultivated in a few establishments in this country since 1824. It is an upright shrub, sometimes growing two or three feet, but flowering abundantly on plants not more than a foot high. The branches are numerous, and closely set with small, veiny, hairy leaves, of an ovate form, with very sharp-pointed marginal serratures. The flowers are tubular and scarlet, about an inch long, with an expanding limb, and are produced from the axils of the leaves all along the growing shoots. Handsome bushes are soon produced from cuttings struck in sand, and when kept growing freely will flower during the whole of the latter part of summer and autumn. A frame or a pit is the most favourable place to forward the specimens in spring. Messrs. Rollisson, of Tooting, have several small plants still in flower.

Lisia'nthus glaucifo'lius. Several specimens of this species are flowering at the nursery of Messrs. Glendinning, of Turnham-Green. It grows bushy, and although the flowers are not quite so large and handsome as those of *L. Russellianus,* it is, nevertheless, very showy when covered with its lilac blue blossoms, which are freely produced, and prominently situated, on the surface of the bush. It is altogether more diminutive than the other, and is a very desirable species for a small greenhouse. It is, we believe, a perennial species.

Melasto'ma sangui'nea. When well grown, this is a fine stove shrub, frequently rising three or four feet, naturally growing tolerably bushy, and if not sufficiently so, easily improved by a little pruning. The stems are robust, and clothed with handsome shining dark-green leaves, with a fringe of long red bristles on each side of the footstalk; the stem, also, is beset with similar appendages. The flowers are terminal, and among the largest of the whole tribe of *Melastomaceæ,* being commonly about three inches and a half across; the segments fit compactly together, and are of a rosy purple tint. With the exception of the sanguineous hue which is spread over the stem, nerves, and bristles, and from which the specific name is applied, it bears a considerable resemblance to *M. macrocarpum.* A well-managed specimen was flowering a few weeks since in a stove at Mr. Loraine's, Wallington Lodge, and, more recently, smaller plants, barely a foot high, have bloomed at the exotic nursery of Mr. Knight, King's-Road, Chelsea.

Plero'ma Benthamia'na. This is decidedly one of the finest, if not the very finest, of all the *Pleromas* yet introduced. A plant about five feet high, entirely the growth of the present season, has been flowering for the last three weeks in a stove at Wallington Lodge. The blossoms are produced in panicles at the end of the main shoots, and are of a very rich and intense violet purple, with a whitish speck at the base of each petal. Plants may be had at most of the metropolitan nurseries.

OPERATIONS FOR NOVEMBER.

The long summer of bright sunny days and the unusual dryness of the ground have been in a high degree favourable in perfecting the maturity of new wood, and in the formation of flower-buds. We may, consequently, expect that those shrubs and other plants in the open ground—which after ordinary seasons are sometimes partially injured in winter, owing to the summer's shoots not being completely ripened—will receive little injury from cold, however severe the coming winter may eventually prove. And from the more highly elaborated state of the sap, we may also confidently look for a profuse display of bloom in another year.

But, nevertheless, there are also other shrubs left exposed of a more delicate nature ; and although these will doubtless endure more hardily, yet some amount of protection will still be requisite. Sufficient, however, has been said respecting this in previous Calendars, and we will only now add, that whatever protection is placed over the leaves and stems, it must not be a permanent one, but should be removed whenever it can be done with safety. In fact, it should never be used only during severe weather ; for the more a plant is exposed, consistent with its due preservation from positive harm, the more hardy it becomes ; and the more it is wrapped up or covered, it becomes so much the more delicate and susceptible of injury.

What is true of plants in the outdoor department, is equally so of those which require a greenhouse or a stove : debility and a greater susceptiveness of cold will always result from too much warmth.

In greenhouses, if the directions of previous months have been followed, fire-heat will very rarely be required for the individual purpose of raising the temperature ; but, as this is frequently a damp month, there is sometimes a necessity for it, to expel excessive moisture. The state of the atmosphere must be continually watched, and whenever the leaves exhibit any mouldiness on their surface, it is a sure indication of superfluous humidity. In such cases, the temperature of the air may be moderately raised, at the same time, however, opening the sashes to admit fresh air. The fires, also, should be kindled early in the morning, in order that ventilation may be given in the most favourable part of the day ; and by allowing them to die out soon after mid-day, the house will not be shut up and kept too warm during the night. Error is too generally committed in this respect, by keeping the fires in too long, and thus raising the temperature to an immoderate degree, producing a condition the most impolitic possible, as regards the welfare of the plants.

A constant circulation of air, and watchfulness against an excessively moist atmosphere, is yet more indispensable in structures devoted to the culture of Heaths, than to miscellaneous greenhouses. And these plants, too, are also more impatient of fire-heat ; so that, whenever it is unavoidable, it must be very temperately and carefully introduced ; and never, without there is an unusual depression of temperature, unless at the same time admitting an abundance of external air.

In stoves constant fires will, of course, be indispensable, and although it is advisable not to encourage vegetation to any great extent by a humid atmosphere, yet it will here be necessary to maintain a somewhat moist air, as many plants scarcely cease to grow during the whole year ; and if an arid atmosphere, in conjunction with a high temperature, is maintained, a serious check will be given to vegetation by the excessive drain exerted by the air upon their surfaces. A moderate amount of moisture then must be constantly preserved, regulating it by the clearness or cloudiness of the weather. In a clear atmosphere a greater degree of humidity will be admissible than in a dark cloudy one.

In the forcing-house a still greater degree of moisture will be required than is demanded in the general stove, for here it is the professed object to stimulate growth. But as we have not, at this season, an equal amount of light to that of summer, neither must we employ other agents to an equal extent, or the growths will be weak, and the plants, instead of flowering vigorously, will be meagre and puny, and unfit for the show-house. Too much haste in forcing defeats its own purpose.

A continued succession of plants, such as *Persian Lilacs*, *Pœonies*, *Deutzia scabra*, *Labur-*

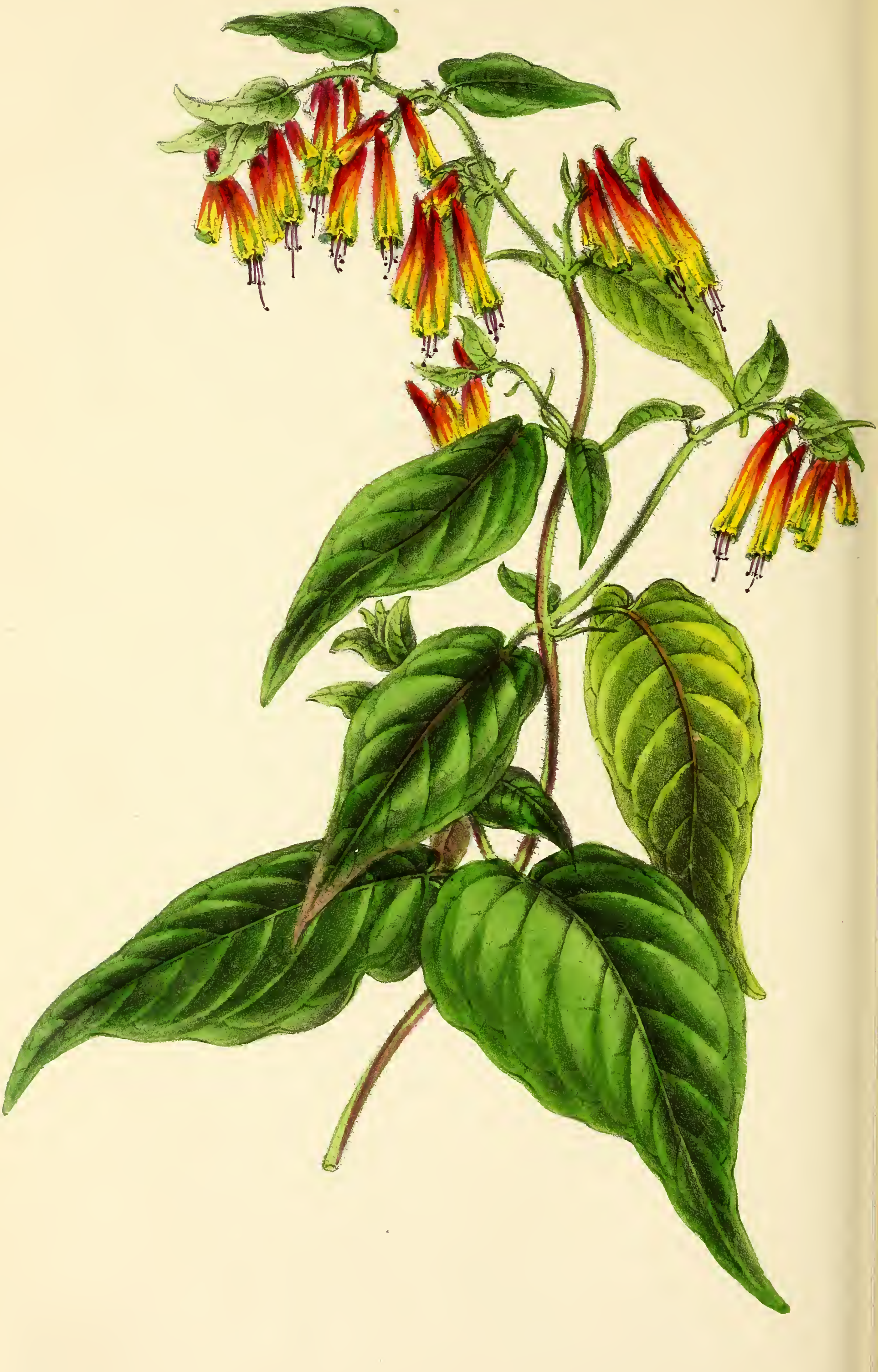
nums, and some of the common sorts of *Pelargonium* which flower freely, should be brought into the forcing house. They ought, however, to be placed, for a week or two previously, in a cold frame, greenhouse, or unemployed vinery, and the temperature gradually raised when they are forcing.

The *Streptocarpus Rexii* is also an excellent little plant for forcing; but the plants should first be prepared by keeping them dry for a month or two on a greenhouse shelf, and then shifting into a rather large pot, employing a rich open soil. If they are afterwards placed in a gentle heat, they will soon begin to flower, and continue to produce a liberal succession for a long time. They are particularly useful for bouquets. The plants should not be all forced at once, but at three or four periods, three weeks or a month apart. Several other common greenhouse plants may also be selected, that will flower with a little encouragement. A few more *Narcissus* and *Hyacinths*, in pots, may be brought from the frames to the forcing-pits.

The best way of keeping Chrysanthemums till they flower is to place them in a deep frame where they can be freely ventilated, and sufficiently protected from frost. They must not, by any means, be kept close or warm, or in a very dry atmosphere, or they will soon become drawn, and infested with insects. Expose them as fully to light as possible; and if the fly appear, it will be advisable to smoke them with tobacco immediately. If kept cool, they will rarely be attacked by the red spider, though otherwise very liable to it; and a low temperature will also help to retard the flowering, which is usually deemed more desirable than to hasten it.

As there is now, generally, a little more leisure, the houses, pits, and frames must be frequently looked over, to keep them clear of weeds, dead leaves, and fading flowers, and to preserve cleanliness throughout the whole. Be vigilant to detect and suppress insects wherever they make their appearance; and if the leaves of any plants, especially orange trees, have a deposit of dust or dirt on their surface, it ought at once to be washed off. One of the greatest pests to stove and greenhouse plants is the Mealy Bug (*Cóccus adonìdum*), and if not directly extirpated, it soon overruns all the plants in a house. A safe and sure remedy against it is to dip a camel's-hair brush in *Hereman's Vegetable Dilutium*, and touch the insect with it wherever it appears. This causes instant death to it, without hurting the specimen, if it be syringed with clean water immediately after the mixture has been used. The plants should be examined from time to time, as some of the insects are so minute as to escape the most vigilant eye at the first dressing. If occasionally looked over during the winter, the pest may be entirely suppressed before the busy season returns.

If the *Dahlias* still remain in the ground, take advantage of the first dry time to have them all taken up, and safely put away in a shed till they are well dried; and before they are finally set by for the winter, be sure to secure the labels firmly to each.



S.Holden del & Lith.

CÙPHEA STRIGULÒSA.

(Strigulose Cuphea.)

Class.
DODECANDRIA.

Order.
MONOGYNIA.

Natural Order.
LYTHRÀCEÆ.

Generic Character.—*Calyx* tubular, gibbose at the base on the upper side; limb wide, twelve-toothed, with six of the teeth erect, and the other six small or nearly obsolete, rising from the sinuses of the inner teeth. *Petals* six or seven, unequal. *Stamens* eleven to fourteen, rarely six or seven, unequal, inserted in the throat of the calyx. *Gland* under the ovarium, thick. *Style* filiform. *Stigma* simple, or rather bifid. *Capsule* membranous, covered by the calyx, one or two celled, at length cleft by the deflexed placenta as well as the calyx. *Seeds* nearly orbicular, compressed, wingless.—*Don's Gard. and Bot.*

Specific Character.—*Stem* shrubby. *Branches* and *calyxes* clammy and hispid. *Leaves* ovate-oblong, acute, rounded at the base, scabrous. *Flowers* pedicellate, alternate. *Petals* six, nearly equal. *Stamens* eleven. *Filaments* villous. *Ovarium* seven or eight-ovulate.

Many plants which have usually been considered to require a stove or a greenhouse, when, at length, the experiment is made to ascertain whether they are capable of existing in a cooler atmosphere, have been found not only to live, but to acquire a character infinitely more enchanting.

The specimen of *C. strigulosa* which first made us acquainted with the species, had been grown in a stove, and although our attention was attracted by the numerous airy-looking flower-bearing ramifications, yet the blossoms were so void of colour, that we passed it by, as deficient in interest. Calling, however, a short time after at the Nursery of Mr. Knight of Chelsea, we were surprised to find specimens in the open air, and of a much better colour; whilst other plants in the stoves, as in the former case, were of a pale greenish yellow hue. It cannot be compared, even in its best condition, with some of the showy members of this genus; but, it is, nevertheless, a very interesting species.

It grows wild at the foot of the Andes near Ibague, and has only recently been introduced to this country, through the Continental nurseries.

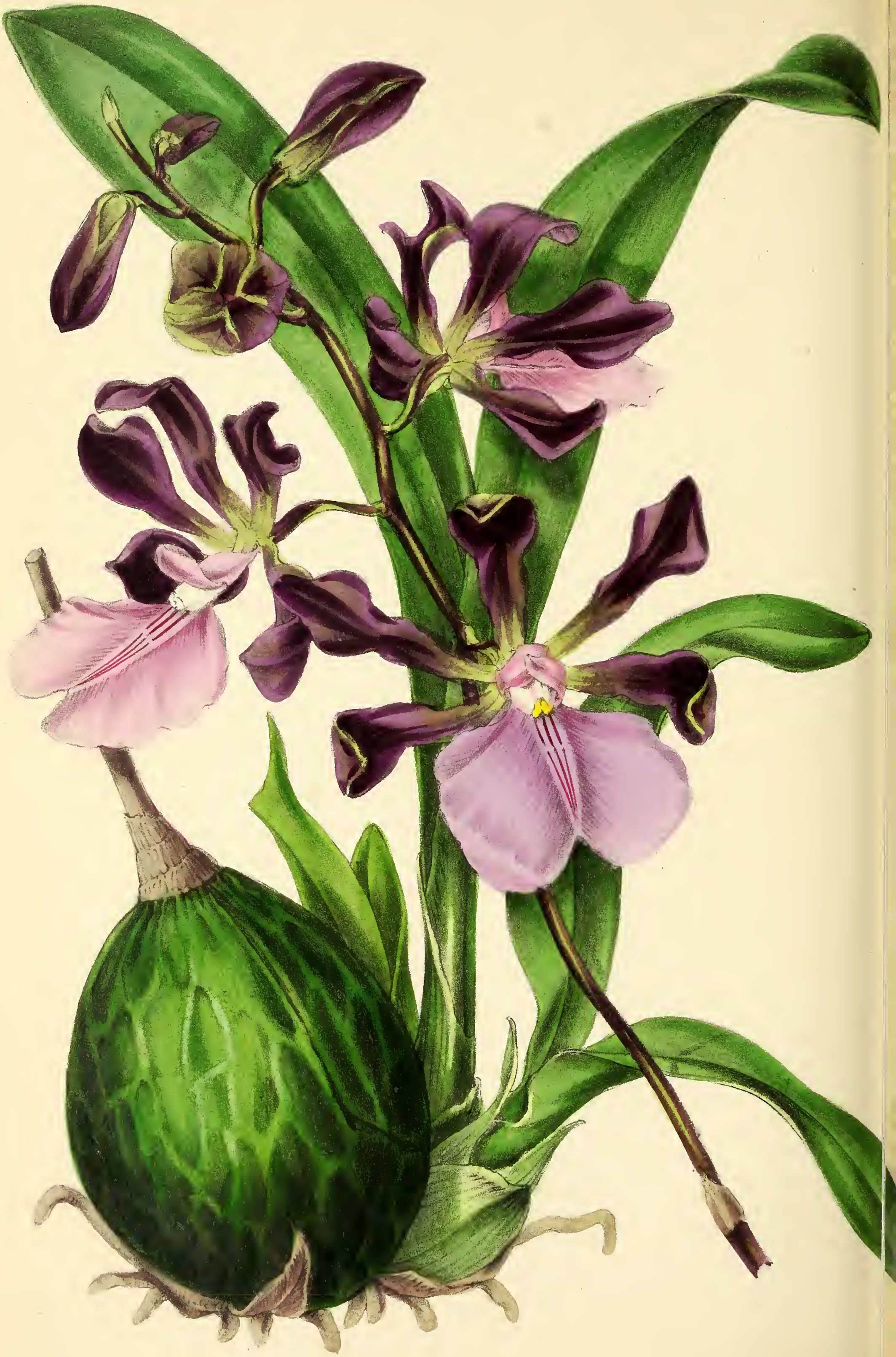
The warmth of its natural habitat precludes us from entertaining a hope that it will ever prove quite hardy in England. It will, probably, require much the same protection in winter as *Verbenas* and *Salvias.* When planted out in the summer season, a shallow well drained border should be selected, where the roots may be kept near the surface; and the soil should not be too rich, lest the plant be induced to grow exuberantly.

The beauty of the species is essentially dependent on the bushiness of the plant, for where there is only one or two long weak shoots, the flowers are too far removed from each other to produce any striking effect; as it is in the aggregate and not individually, that their greatest interest is vested. Pruning back the growing shoots must then be early, and often practised It is necessary, too, that the flowers be exposed to all the light that can be commanded; otherwise they will not acquire a good colour.

The points of the young shoots an inch or two long, taken off below a joint, and subjected to the ordinary treatment of cuttings, rarely fail to strike root in a short time.

The curved form of the capsule supplied the hint for a generic name, which is altered from the Greek word *cuphos*, curved. The specific name is suggested by the numerous stiff appressed hairs, which cover most parts of the plant, especially the leaves, stem, and calyx.

Our drawing was obtained at Mr. Knight's Nursery last July.



S. Holder del & Lith

EPIDENDRUM MACROCHÌLUM, *var.* ROSEUM.

(Rose-coloured, large-lipped Epidendrum).

Class.
GYNANDRIA.

Order.
MONANDRIA.

Natural Order.
ORCHIDACEÆ.

GENERIC CHARACTER. — *Sepals* spreading, nearly equal. *Petals* as large as the sepals, or narrower, rarely broader, spreading, or reflexed. *Lip* wholly or partially united with the margin of the column ; limb entire or divided ; surface frequently ribbed or tuberculated. *Column* elongated, with a recurved margin, often fimbriated. *Anthers* two to four celled, fleshy. *Pollen-masses* four.

SPECIFIC CHARACTER.—*Pseudo-bulbs* ovate, smooth or wrinkled, never furrowed. *Flowers* in erect, simple spikes. *Sepals* obovate, mucronate, spreading, incurved at their extremities. *Petals* of similar form, rather smaller. *Lip* with lateral lobes enveloping and almost concealing the column, ovate, acute ; middle lobes very large and broad, obcordate, sometimes saddle-shaped ; disk flattish, fleshy. *Column* not attached to the lip, triangular, compressed, wingless. *Anthers* large, orange-coloured, conspicuous.

VARIETY—*Roseum.* *Lip* a beautiful rose-colour.

ONE of the most showy species of *Epidendra* that we possess is undoubtedly *E. macrochilum.* The large expansive white lip of the flower, so richly spotted with crimson in the centre, is especially interesting amongst the crowds of dingy bronzed flowers so numerous and common in the genus.

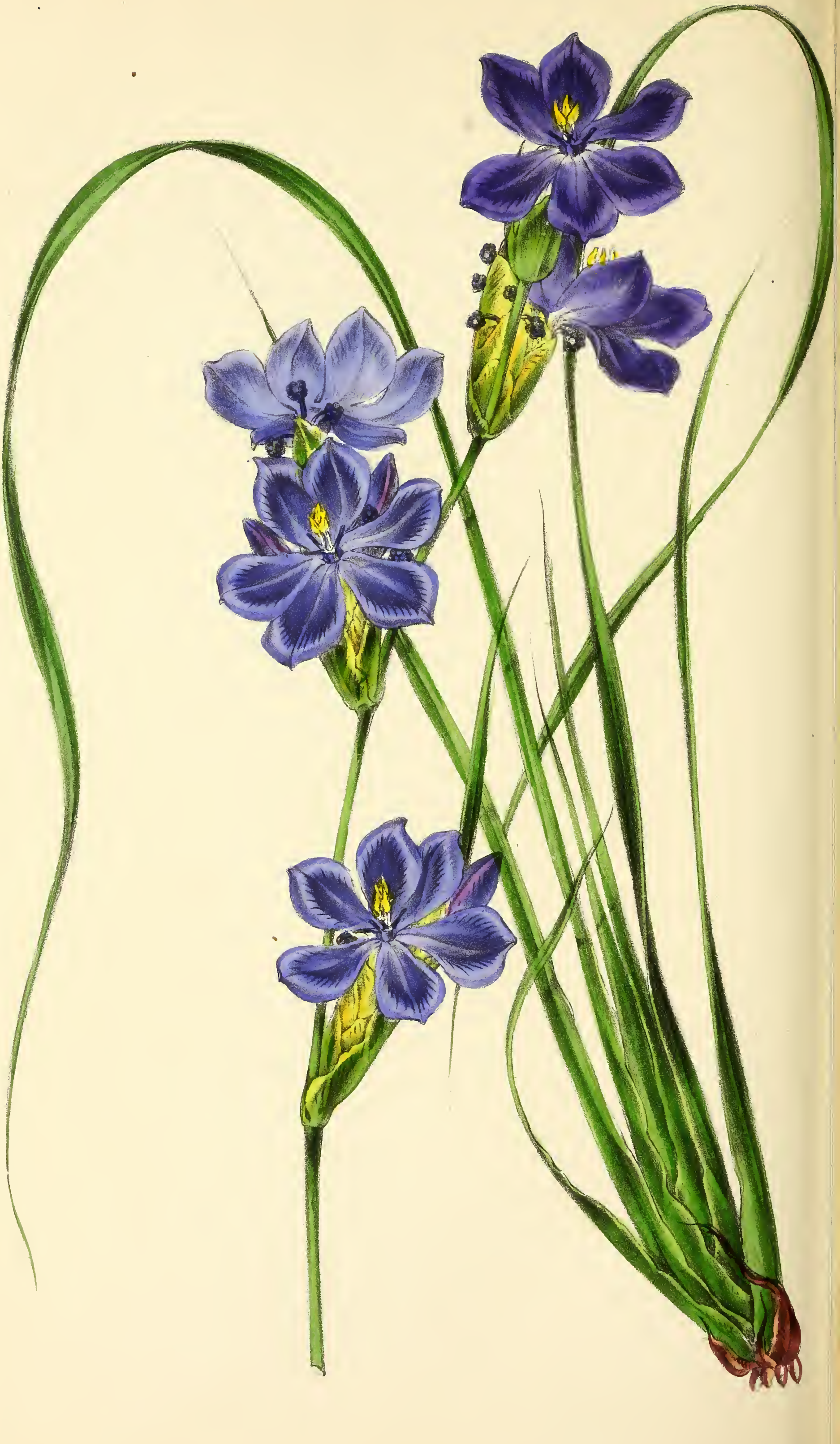
Within the last two years several varieties of this superior species with rose-coloured blossoms of various shades, and with a slight dissimilarity in form, have been received through different channels from Guatemala; the parties chiefly instrumental in forwarding them being Mr. Hartweg, the collector for the London Horticultural Society, and Mr. Skinner.

The variety we have chosen for our illustration was flowered by Mr. Carson, in the collection of —— Farmer, Esq. of Nonesuch Park, near Cheam, Surrey, who courteously favoured us with permission to delineate it in April last. It is chiefly remarkable amongst other rose-coloured varieties, in the form of the lip, which instead of being saddle-shaped by the usual deflexure of the sides, is perfectly flat, exposing the entire surface to view. In this respect we consider it superior. In the varieties with saddle-shaped lips, the middle lobe is generally smaller, and the two side divisions somewhat larger than in the one depicted. The beautiful crimson-purple streaks which spread over the surface of the lip are common to all.

Attached to a block of wood or planted in a basket filled with some loose and highly porous material, and suspended so that the racemes of flowers may bend gracefully over the side, it forms a most conspicuous and engaging object.

Propagation may be effected by detaching some of the older pseudo-bulbs, and placing them in a gentle bottom-heat, when they will soon begin to swell the latent buds at their base, and produce fresh pseudo-bulbs.

A high temperature is far from being the most appropriate. The cooler Orchidaceous house, or a close greenhouse, is more suitable. When in a growing condition they need a liberal supply of water at the roots, and frequent syringings will be found highly beneficial. An opposite course must be persisted in during the cessation of growth, as all moisture farther than merely what is sufficient to maintain the pseudo-bulbs full and unshrivelled, is pernicious, and frequently destructive at that period.



ORTHROSANTHES MULTIFLORA.

(Many-flowered Orthrosanthes.)

Class.
TRIANDRIA.

Order.
MONOGYNIA.

Natural Order.
IRIDACEÆ.

Generic Character.—*Spathe* many-flowered, two-valved, keel-shaped, with a scarious margin, membranous. *Perianth* petaloid, salver-shaped; tube very short and triangular; limb six-parted, segments equal. *Stamens* three. *Filaments* connate below, inserted at the base of the exterior segments. *Stigmas* three, filiform, dilated at the base, apex obtuse and fimbriated. *Capsule* oblong, three-angled. *Seeds* numerous.

Specific Character.—*Plant* a close-tufted herbaceous perennial. *Leaves* numerous, distichous, linearly-ensiform, striated longitudinally, sheathing at the base. *Scape* of the same length as the leaves, a little branched. *Spathe* with ovate-keeled valves. *Flowers* azure-blue, only one from each spathe expanding at once. *Filaments* blue and smooth.

The earliest specimens of this interesting little plant known in this country, were raised from seeds collected near Lucky Bay in New Holland by Mr. William Baxter, about the year 1820. It does not appear to be yet very widely disseminated; certainly not to that extent to which its worth entitles it. It is, however, pretty abundant in some of the great nursery establishments in the suburbs of London.

During the blooming period, it is a very suitable plant for the front stage of a greenhouse. Numerous offsets or suckers spring from the old plants, near the bottom of the stem, and protrude thick fleshy roots from their base, and thus a large tuft of healthy and vigorous-growing plants is soon obtained. They do not grow more than about a foot high, and the inflorescence is just elevated to about the same level as the tips of the leaves. No more than a single flower is developed at the same time from one spathe, but they are of considerable size, and the sheaths are numerous, consequently they make a good show.

The flowers, however, do not remain expanded the whole day; they open early in the morning and sometimes close soon after mid-day, but more commonly they remain unfolded until three or four o'clock. The same blossom re-opens for several successive days, and there is always another ready to display itself as the first dies, till the whole have expanded and closed and faded away.

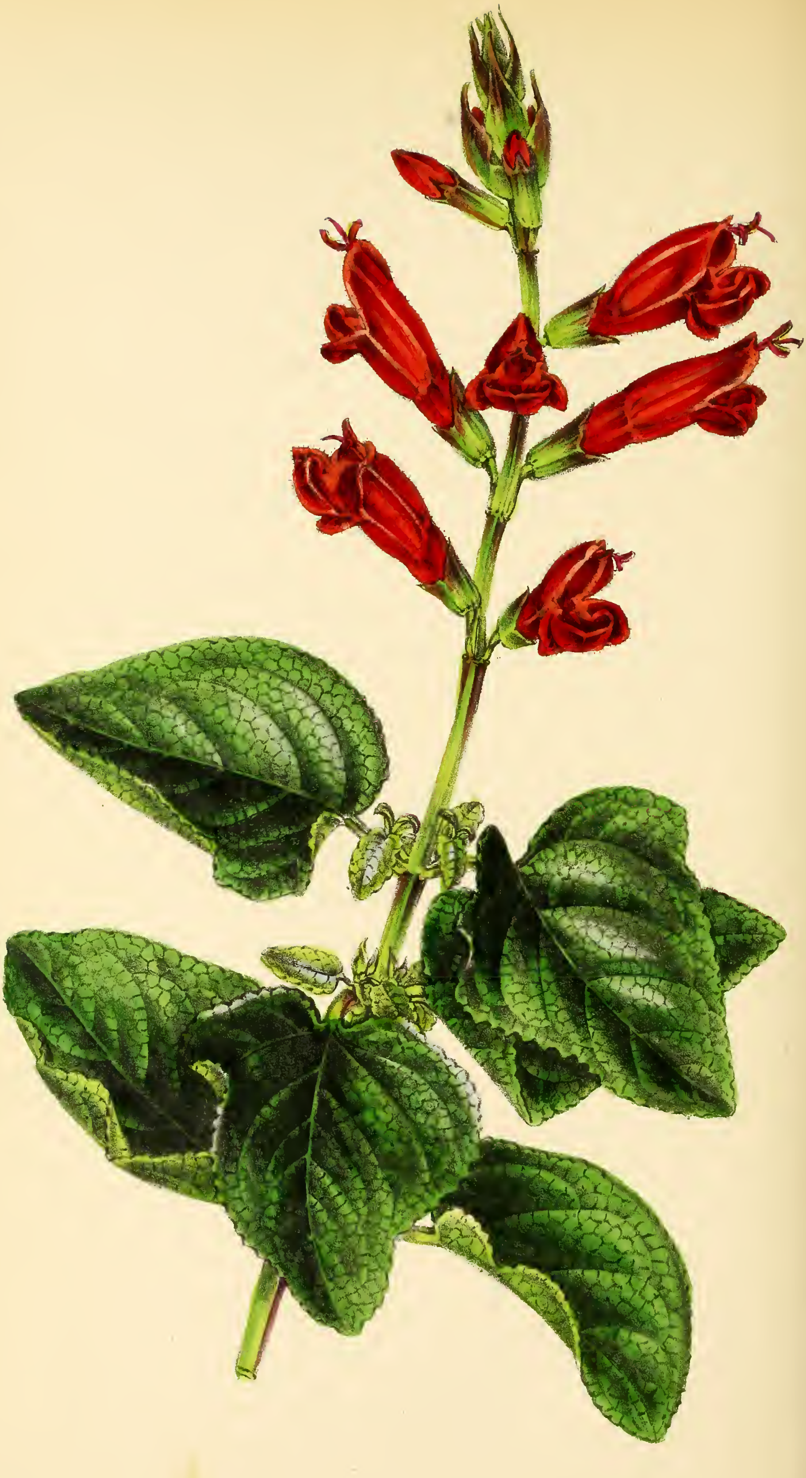
Although the greenhouse is decidedly the most proper place for it when in flower, it does very well in the open air in pots after the end of May; but its leaves are apt to assume a yellowish and sickly aspect, especially if exposed too early, or too suddenly. It is preserved through the winter in frames with the greatest ease; and when continued in such structures (kept rather close) till it flowers, it acquires a degree of vigour and health unknown even to the plants allowed to remain constantly in the greenhouse.

Plants of this kind are frequently injured by planting in a soil of too close a texture. An open loam full of decaying vegetable fibre, with a small addition of well-reduced leaf-mould, makes an excellent compost. In potting, plenty of drainage should be employed; for, though they require a good share of water, all superabundance should be enabled to drain off freely.

Propagation is easily managed by separating the offsets before mentioned, and planting them singly in pots, as soon as they begin to form roots.

Our figure was made in the Nursery of Messrs. Henderson, at Pine-apple Place, Edgware Road, in March 1844.

Orthros the morning, and *anthos* a flower, are the roots from which the generic name has been formed; and their signification applies to the circumstance of the blossoms expanding in the morning, and closing soon after noon. The specific name refers to their vast numbers.



S. Holden, del. & Lith.

Salvia strictiflora.

SÁLVIA STRICTIFLÒRA.

(Erect-flowering Sage.)

Class.
DIANDRIA.

Order.
MONOGYNIA.

Natural Order.
LABIATÆ.

Generic Character.—*Calyx* tubular, ribbed, unequally two-lipped, permanent. *Corolla* tube dilated upwards, compressed; upper lip concave; lower lip broad, three-lobed, the middle lobe largest, cloven. *Stamens* with two divaricated branches, one only bearing a perfect oblong, single-celled anther. *Germen* four cleft. *Style* curved, with the stamens usually onger. *Stigma* forked. *Seeds* four, oval, in the bottom f the dry converging calyx. *Don's Gard. and Botany.*

Specific Character. — *Stem* shrubby. *Branches* lothed with tomentose pubescence. *Leaves* petiolate, ovate, acute, crenately serrated, cordate at the base, thickish, rather fleshy, nearly glabrous. *Floral leaves* ovate, acute, membranous, deciduous. *Racemes* elongated. *Whorls* two-flowered, secund. *Calyx* tubular, striated, pubescent, having the upper lip entire, and the teeth of the lower lip ovate, acute. *Corolla* more than twice as long as the calyx; tube elongated, incurved, tomentose outside; lips nearly equal, hardly spreading: lateral lobes of lower lip very short. *Genitals* exserted. *Style* glabrous.

The genus *Salvia* is well known to consist of a vast number of species, many f which are as remarkable for their beauty and bright colours, as others are ninteresting in their general figure, and void of brilliancy in the hue of their lowers. The latter characters are more particularly the faults of the strictly erbaceous species, whilst the larger number of the shrubby and suffruticose kinds ange under the former class.

The subdivision of the genus to which the handsome plant now figured elongs (*Longiflora*) is almost entirely composed of shrubby species, distinguished y the tube of the corolla being two or three times longer than the calyx, and the pper lip usually extending to a somewhat greater length than the lower; and it s in this section that the majority of the most choice and charming species are nrolled.

Although yet so little known in the country, we learn from the Botanical Iagazine that specimens of *S. strictiflora* were flowered in England so long back s December, 1831. The same authority states that it was discovered by Ir. Cruikshanks between Yazo and Obrajillo, in the valley of Canta, in Peru; nd subsequently collected by Mr. Matthews, at Cuesta, of Huamaritango and arcochuco, Peru, where the natives distinguish it by the title of Socoencha.

Being a plant of rapid growth, liable to extend its soft-wooded branches to a great length, and bearing its upright racemes of vermilion blossoms at their extremity, the propriety and utility of occasionally pinching off the ends of the growing shoots, to produce increased bushiness and quantity of bloom, is self-evident. And for the same reason it should never be planted in a gross strong earth of an adhesive or retentive nature, as this would augment the natural propensity to undue exuberance. Equal quantities of sandy loam and peat, with a loose stratum beneath to carry away superabundant moisture, will be most consonant with the habit of the species.

It should be placed in an airy part of a greenhouse or frame to stand the winter. Propagation is easily managed by preparing cuttings of the young wood in the usual way, and placing them in a gentle bottom-heat.

The accompanying coloured delineation was prepared from a drawing taken at the Nursery of Messrs. Lee of Hammersmith, last July.

The upward direction of the tubular flowers has suggested the specific name.

GARDENING AS A SCIENCE.

VEGETABLE PHYSIOLOGY.—No. XI.

We close this series by a few observations on the nature and offices of Manure, as connected with the nutrition and growth of plants. There is no other subject in the philosophy of agriculture and horticulture which has been so little understood, so involved in contradiction and bewildering conjectures.

Our remarks cannot extend to agriculture, otherwise we should find a rich store of materials. Horticulture, however, is not a barren field; and if we have succeeded in the previous articles to elucidate the theories of vegetable organisation and function, there will be the less difficulty in appreciating the phenomena assimilation, on which the discoveries of modern chemistry have thrown much light.

It has been seen that the ultimate elements of structure are few; that four of them are organic—in other words, capable of uniting under various forms—and in these forms constituting not only organic structure, but, in many instances, the *products* of that structure. Thus, 1st. Oxygen and hydrogen, from a gaseous form, unite and become liquid water. Water enters into the fluid products of all plants. 2nd. Hydrogen and nitrogen form ammonia. 3rd. Carbon and oxygen unite in the form of carbonic acid gas; and carbon is the base of lignin and of woody fibre. Now, all these organic elements—being originally gaseous—exist in, and may be derived from, the air; but, as we find potass, soda, chalk, muriatic acid, iron, &c. &c., not one of which can, under ordinary circumstances, be referred to the atmosphere, we must refer them to another medium, and that is the ground. These substances, therefore, and some others, are inorganic; and, as such, are found in the ashes of plants, having resisted the action of fire that had decomposed and gasified the substances which in themselves are the products of the organic structure.

In a former article it was stated that every substance which combines the four organic elements, under whatever name it pass, is *bonâ fide* a manure. Thus, the vegetable portion of black heath-mould is *manure;* the other ingredient being *sand*, which is not decomposable under ordinary conditions, and, therefore, is inorganic. This sand is *silex*, one of the chief constituents of granite; but, by the action of potassa, it is attracted to that alkali, and uniting with it, becomes soluble *silicate of potassa.*

Some persons have supposed that pure flint is solid oxygen; and that able chemist, Mr. Hume, wrote a small treatise on the subject, wherein he supported his hypothesis by many facts, ably and pertinently adduced. If oxygen be a modification of electricity, flint and crystal are two of the most powerful electrics to which we can appeal.

Humus has for some years been the fashionable term by which modern writers mean to express the most perfect food of plants; but its credit, and that of the theory of *humic nutrition*, are on the wane. For, during a course of culture, humus is added to the soil, and so far from being dissolved and sucked up into the plant, the plant confers it to the soil. But *humus* has its offices, and these it performs during its own decomposition, through the agency of air and moisture. Whenever water is decomposed, a stream of electricity passes, hydrogen and oxygen are liberated, and these unite with the elements of the decomposing humus, and produce carbonic acid, hydrocarbon, and perhaps some ammonia. But no pure solution of the manure passes into the plant. Liebig thus introduced his theory, which appears to acquire ground every day:—

"Woody fibre in a state of decay is the substance called humus. The property of woody fibre to convert surrounding oxygen gas into carbonic acid, diminishes in proportion as its decay advances, and at last a certain quantity of brown coaly-looking substance remains, in which this property is entirely wanting. This substance is called *mould;* it is the product of the complete decay of woody fibre. Mould constitutes the principal part of all the strata of brown coal and peat."

This passage is cited in evidence of the origin of coals: these combustible substances differ much in their components, but all are evidently derived from the slow decomposition of wood, in which, by the agency of water, some flinty matter is introduced, and more or less of bitumen or asphalt. Coal and vegetable mould are therefore not dissimilar: but the *humus* of the chemist is not that substance which cultivators understand by the term—by it they infer the black decaying matter of an old dunghill, or mass of leaves in a state of decay; and we have now to consult the theory of Liebig on the offices of such humus when incorporated with earth. "Humus acts in the same manner in a soil permeable to air. It is a continual source of carbonic acid: by loosening the soil which surrounds young plants we favour the access of air, and the formation of carbonic acid; and on the other hand the quantity of their food is diminished by every difficulty which opposes the renewal of the air. An atmosphere of carbonic acid is therefore contained in every fertile soil, and is the first and most important food for the young plants which grow in it. In spring, when those organs of plants are absent (the leaves), which nature has appointed for the assumption of nourishment from the atmosphere, the component substance of the seeds is employed in the formation of roots. The roots perform the functions of the leaves from the first moment of their formation; they extract from the soil their proper nutriment; namely, the carbonic acid generated by the humus. A plant at this time receives its food, both by the roots and by the organs above ground, and advances rapidly to maturity."

In these detached portions, which are thus collected together, we find the sum and substance of the new theory of vegetable nutrition, so far as the roots are concerned, and we must abandon, *in toto*, the notion that plants absorb manure in watery solution:—they *can* do no such thing,—but they have the power by vital action to stimulate the decomposition of water, and thus to impel a current of electricity, which decomposes vegetable or animal remains, and simultaneously forms many gaseous compounds, soluble in water, colourless and tasteless: these also combine by the *specific* attractive power of the roots with alkalies and other inorganic salts, and pass with them (impelled doubtless by electricity) into the vascular tissue, and carry forward and upward the ascending sap.

Sap, therefore, is a very delicate and weak solution of carbonic acid, hydrocarbon, and saline matters, all *derived from the soil*, and susceptible of infinite modifications within the cellular tissue of the plant. By analysis some faint traces of saline matter can be found in sap, as it flows from the vine and birch; but it is futile to adduce such experiments; because pure ascending sap cannot be obtained free from admixture with the laborated juices of the stem; let us see then how far the leaves may operate when properly developed.

"We know," says Liebig, "that the functions of the leaves and other green parts of plants are to absorb carbonic acid, and with the aid of light and moisture to appropriate the carbon. But the new products arising from this continual assimilation are no longer employed by the perfect leaves in their own increase: they serve for the formation of woody fibre, and all the solid matters of similar composition. The leaves *now* produce sugar, starch, and acids which were previously formed by the roots, when they were necessary for the development of the stem, buds, leaves, and branches of the plant."

"A peculiar transformation of the matters contained in all plants takes place in the period between blossoming and the ripening of the fruit; new compounds are produced which furnish constituents of the blossoms, fruit, and seeds."

While we admit as general facts the data thus laid down, we must not forget our ignorance of the *vital principle*. *That* may be, and probably is, of the nature of that ethereal light, which for want of a proper title we style electricity: its source is the sun, and its intermedia are living vegetables, which connect it with the earth. The entire machinery is perfect; and thus each plant, during its term and course, is enabled to attract, absorb, transform, and excrete. Of minutiæ we are ignorant, but all the work is beautiful, and the smallest atom, even in a state of decay, is destined to be reunited to active, living "organisms," which again perform their part in the eternal circle. The electrical development of gases from water, and solid matters, and their reconversion in fluid and solid modifications, rank chief among the wonders which it has been the privilege of modern chemistry to reveal.

WINTER GARDENS.

Much as the attention of cultivators has been engrossed with rendering flower gardens, stoves, and greenhouses, the interesting places in summer which, under skilful designing and management, they now rarely fail to prove, it has seldom been turned practically to the improvement of the pleasure-ground in winter. And, as in many parts of the country there are gardens which are never, or very rarely, seen by their proprietors at any other season, we imagine they should then be made as enlivening, and kept with the most scrupulous neatness that the unfavourable period will permit.

We are led to the present remarks from an observation of the cheerful aspect which those gardens present where industry and care have supplied a verdurous covering to the parterre, to succeed the flowers which autumnal frosts have destroyed, compared with those which are left with the flower-beds naked, or exhibiting the wreck of former beauty. However much the latter may serve to prove that success has not been wanting in the season gone by, it conveys, at the same time, a more forcible impression of the dreariness of winter, and betrays an utter disregard of all regularity and neatness — a disregard which the mind naturally carries back and views in connection with the gaiety of summer, and which cannot fail prejudicially to influence an estimate of the beauty of the garden at that season. A naked border, if neatly kept, is infinitely preferable to the negligent aspect of such a place; and a still more agreeable effect may be produced by the aid of a few low-growing evergreen shrubs. And though, in extensive grounds, it would be impracticable, and, indeed, scarcely desirable, to carry this feature throughout the whole garden, yet, in those parts where the eye is continually wandering over, in the immediate vicinity of the mansion, or in any of the more interesting and frequented parts, especially near the greenhouses and stoves, a vast improvement may be effected by planting, temporarily, the vacant beds.

This, at first sight, may appear an expensive undertaking, as well as a very troublesome one; but it is surprising at how small a cost, both of money and (what is almost the same thing) of time, it may be managed. A few extra plants, and a small space in some secluded nook of the garden, as a reserve ground for preserving and propagating them during the summer, are nearly all that is requisite.

The selection of suitable plants is the next consideration; and to avoid the too even character and sameness which is a common fault in most gardens where the borders are planted in winter, these should be more varied and extensive. In choosing them, none should be taken that are not completely hardy, and likely to retain a healthy green throughout the winter. It will also be desirable that they be such as are easily procured, and managed without difficulty, and, at the same time, bear a moderate price.

Perhaps one of the very best plants for the smaller description of borders is that neat little undershrub which grows so plentifully on most of our upland moors and heaths, the *Vaccínium Vítis Idœ́a*, or common Cowberry. In many parts of the country this may be procured immediately from its native locality, and when divested of the moss and sedge that usually creep about its roots, and become entangled with its lower branches, it has anything but a common or uninteresting appearance. But by growing specimens expressly for the purpose, they may be brought to assume a much more densely bushy character than is commonly seen amongst wild specimens, and thus rendered more fitting for their intended situation. *V. macrocarpum* and other trailing species may also be sparingly used; but their long rambling habits prevent them from being so extensively available as that first mentioned.

Two other British plants, easily obtained in many districts, and well suited for adorning the lesser plots, are *Empétrum nìgrum* and *Erìca cinèrea.* It will be quite necessary, however, that these plants, and more especially the former, should be grown in the reserve garden, and prepared for this purpose at least a year previously, as they grow loosely in a wild state. Young plants of the latter may sometimes be obtained sufficiently dense and compact to be used at once. Nothing, however, can be more easy than to make them grow close and bushy; for even the *Empetrum*, though commonly so straggling, when planted separately in a peat soil, usually assumes that character without further trouble. Several other species of Heaths, such as *E. carnea*, *multiflora*, and *vagans*, may be very properly added. These species are all readily propagated, and soon form neat plants; the first, especially, grows in close dwarf tufts, and has the additional recommendation of flowering towards the end of February in mild seasons and favourable situations. Small plants only should be planted in the lesser beds, but larger tufts may be used with good effect for beds of greater dimensions.

Pernéttya mucronàta is another excellent plant for small beds; being a dwarf-growing under-shrub, with very dark green foliage, not much unlike the smaller-leaved Myrtles. It is easily multiplied by separating the numerous suckers annually thrown up from established plants, or by taking off cuttings of the half-ripened wood. The latter method is to be preferred, as better plants are generally produced by it, and they are less subject to emit suckers than those which have been originally raised from them. It will, however, be quite necessary to grow this species in pots, to prevent the roots from rambling too far; for when they are suffered to extend without some check, similar to that effected by pots, they cannot be removed with a sufficient ball of earth about them to ensure their safety and healthy appearance through the winter.

To this list we may add *Polygala chamæbuxus*, and the Minorca Box, (*Buxus balearica*). There is no fear of either of these experiencing any damage from being taken directly from the nursery-bed, and returned in spring, owing to the multitude of small roots which ramify and become matted together, without spreading far from their axis, and consequently securing a quantity of earth amongst them. With this selection, a tolerably varied character may be imparted to the smaller beds, and the numerous fine narrow leaves of the Heaths and *Empetrum* will be an agreeable contrast with the more ample breadth of the others.

For the more extensive beds, species of a stronger habit and larger growth, or large specimens of some of the preceding, will be more desirable. The common Holly, Portugal Laurel, and Rhododendrons, are amongst those usually employed. A more diversified air may be communicated by intermixing some of the variegated Hollies, and a bed or two of *Aucuba japonica*, small plants of Irish Yew, especially for small circular beds, and seedlings of the common Juniper.

We must not omit to mention here the *Mahonia* (or *Berberis*) *aquifolium*, which is decidedly one of the most ornamental plants that can be laid hold of, and is now easily procured, either from seeds, which ripen in astonishing abundance, or from suckers. The more dwarf and bushy, the greater the suitability of the plants; therefore, whenever they grow too tall, and appear in anywise deficient of foliage in their lower parts, the longest shoots must be cut back, in the spring, when they are returned to the reserve garden. By this process a renewal of foliage and additional compactness will be acquired before another winter.

We might bring forward many other shrubby plants equally adaptable, but these are sufficient to produce a most important degree of cheerfulness in the aspect of a garden in the duller part of the year. Other species, however, which may, in some cases, better suit the convenience, will, doubtless, suggest themselves to the mind of every cultivator.

Although barely coming within the scope of the present article, we may here be permitted to pass a few cursory remarks on that engaging plant, when adorned with its orange-red fruit, the *Cratægus Pyracantha,* or Evergreen Thorn. It is by no means a rarity in gardens, but its worth, nevertheless, is not appreciated as it deserves. Alike suited as an adornment to the walls of the cottager's home, and to beautify the domain of the wealthy, and procurable without difficulty at a moderate price, a handsome object at all times, but more especially in winter, it has claims to notice which are surpassed by few of the denizens of British gardens.

It is principally as a covering to a naked wall, or to ramble over a porch, or as a verdurous wreath round a window, that it forces itself on our attention. In all such situations it is a continual ornament throughout the year, as it is never wholly divested of leaves, and in spring and early summer is enlivened with blossoms, fragrant as the common Hawthorn of the hedges, and in autumn covered with beautiful ripening fruit, which remain on the branches for the most part of winter. These are forcible reasons for admitting it to a place in the immediate vicinity of the dwelling.

But we would not confine it to the places just pointed out. It may, with propriety, be trained over a trellis-walk, or along with the rose or honeysuckle, entwined round a pillar or a pole. In the latter case, the accompaniments must be subordinate to it, as they are merely wanted to contribute a little gaiety in summer, and would injure the foliage of the Pyracantha, if permitted to remain in much profusion. By severe pruning it may also be induced to assume the character of an upright bush, and kept in a dwarf state, without diminishing, but rather increasing, the free production of flowers and fruit. The way to effect this is to prune closely whilst the plant is young, and afterwards to leave a few shoots each year at their full length, to be afterwards cut away as the younger ones become fruitful. Plants so treated may appropriately occupy permanently a small bed on a lawn, if thickly enough planted to enable the shoots to intermingle one with another, or they may also be mixed with other plants in the front of shrubberies, or in masses of evergreens.

But, perhaps, a situation more in accordance with the natural character of the species, and one in which it cannot fail to create a very interesting feature, is when planted behind rocks, and the long shoots allowed to grow wildly, and rove loosely over the face, or lodge in the crannies between them. This has a more natural appearance, and carries with it an air of freedom and gracility, which always suffers under the stiffer and more confined system alluded to above.

To come directly, however, to the subject of winter gardens, although in each of the situations above mentioned, it is principally as a winter plant that it is most conspicuously interesting, the Evergreen Thorn may likewise be treated as a pot plant, kept in the reserve ground during summer, and at the proper season transferred to the borders of the pleasure-ground, amongst the plants previously noticed. A few plants, also, that have been encouraged in larger pots to produce fruit, and kept pruned as before described, may be retained for the vases about the greenhouses or mansion in winter, which at that time can only be furnished with the very hardiest plants. When applied to this purpose, it will be necessary to envelope the pots in moss, or some material capable of repelling frost, or the swelling of the earth will burst them. Pruning seems essential to the well-being of the plants in all places ; and especially during the earlier stages. Without it the lower portion of the stem will be barely bushy enough to make a good covering, and the branches may spread over a wide surface without producing a proportionate profusion of flowers and fruit. As the plants become old, the severity of pruning may be relaxed, if not entirely withheld, as they eventually obtain a less luxuriant and more fruitful disposition.

Hitherto we have confined our remarks wholly to shrubby plants; and the greater facility of procuring a variety applicable to winter gardening, necessarily obliges the cultivator to have recourse to them more largely than to herbaceous species. The latter, however, ought not to be wholly excluded, as several species may be found that will contribute largely to the production of a sense of cheerfulness in the flower garden during winter. The common double Snowdrop (*Gálanthus nivàlis*), the *Leucòjum vérnum*, and *L. tricophyllum*, and a little later, the vernal Crocuses, with their white, purple, and yellow or streaked flowers, are not only interesting as the harbingers of a more genial season, but are in themselves exceedingly attractive when closely planted in small beds. But, as they do not appear above ground till late, a few beds only should be devoted to them.

Beds of the different species and varieties of *Hepática* are also an excellent addition to a garden in winter, especially the double blue and red varieties. They may always be had covered with green leaves, and displaying an abundance of blossoms from January till April. The *Asàrum europœum*, too, though it has no conspicuous flowers, is also furnished with a profuse mass of shining leaves of the deepest green. To enable the culturist to remove these plants without danger, the border in which they are placed during summer should be divided into compartments by slate slabs,—which may be procured at a cheap rate,—placed parallel to each other, at about eight or nine inches apart. By this means they may be transplanted with as little risk of injuring the roots, as if they had been kept in pots.

FLORICULTURAL ŒCONOMICS.

If we were in the habit of prefacing our articles by expressive mottoes, we should choose as the heading of the present one, that homely and household maxim—" do everything at the proper time."

Almost all the success of a gardener, and certainly all his comfort if he be a conscientious man, will turn upon adherence to this commonplace rule. Indeed, nothing is well done, except by accident, that is not done precisely at the proper period. And the arrangement of the details of gardening practice involves just such an amount of experience as shall enable the directing mind to get every thing accomplished at that particular season which is most suitable for its performance.

These assertions, however, are such decided truisms, that a writer is likely to peril his credit by putting them forth. Nor should we have hazarded such a contingency, did we not feel that an opportune enforcement of the plainest truths is often of more value than the most elaborate abstract dissertations.

The culture of flowers, and of an ornamental garden, is, in fact, made up of the commonest routine. But, on the adaptation of every process to the circumstances of the case, and on the knowledge and tact requisite to attend to every little matter just when it can be most satisfactorily done, the appearance of a place, and the professional character of a gardener, will mainly depend. Like the wheels of an intricate piece of machinery, if the smallest one is out of order, or fails to fulfil its proper office, the whole immediately become deranged, or cease to work at all; so the order and finish of a garden is interrupted, or some of its parts thrown entirely out of culture, by the neglect of a few trivial points, which have escaped the cultivator's memory at the season in which they ought to have been looked after.

But in order at once to give this paper a more pointed and definite aim, we shall advert to an operation or a class of operations generally performed at the present season, and which is included in the comprehensive term "ground-work." This phrase takes in mainly those alterations and improvements of a place which an ingenious gardener will yearly be finding necessary; and, subordinately, the common processes which are adopted for clearing or pulverising, or otherwise preparing the ground in which ornamental plants are grown.

Ordinary experience enjoins that ground-work should be done at the fall of the year, because, firstly, the removal of earth in dry summer or frosty winter, costs nearly double the labour, the use of a hack being required; and, secondly, with the view of getting the ground ready for planting in early winter, or for receiving the pulverising and fertilising influences of frost or snow; and thirdly, on account of the absence from a garden at this period of those attractions which allure many visitors; and fourthly, because this is the time at which there is least to do elsewhere, and when workmen can best be spared from other departments.

While, however, it is the usual practice to defer work of this description till the winter is commencing, we would recommend its commencement at an earlier period, for several reasons. If begun at the end of August or the first part of September, it might be completed (supposing it were not very extensive) in time to allow of turf being laid, and trees planted at the right time, and everything put in order before the approach of frost. Where extra men have to be employed, this would produce a saving also in regard to the length of the days, and the chances of the work being interrupted by wet weather.

We refer here only to the making of new features in pleasure gardens, or the modification of old ones, and not to digging, trenching, or any of the simpler and customary operations. These last must of course be deferred till the blooming season has passed over, and all the leaves have fallen, and there is nothing else of consequence requiring attention; for it would be preposterous to dig over beds or borders for the purpose of giving them a neat appearance during winter, until it was certain that leaves would not be strewn over them from neighbouring trees.

Still, borders and beds that have to be dug over should invariably be done before Christmas, as the action of frost on newly lightened ground has a most beneficial effect.

Partly in connection with this subject, we may mention the mischievous consequences of doing anything which causes ground to be much trampled upon during wet weather. Every footstep on earth that is penetrated by the roots of plants does injury while that earth is very moist, inasmuch as it lessens its draining properties, occasions the accumulation of water, and prevents the free entrance of air. Indeed, it is bad at any time to tread on ground in which plants are cultivated, if it can be at all avoided; though the injury is greatly increased when such ground is full of moisture.

It may be safely taken as a rule, therefore, that anything which has to be done to plants cultivated in beds, borders, &c., or to the ground in which they are growing, should be done while that ground is dry.

As another item in the same category, we might mention the practice of raking ground that is ornamentally planted. It certainly tends to heighten the finished aspect of a garden, and to impart a considerable air of neatness. But if carelessly performed on a soil that is tolerably retentive, while that soil is for the most part saturated with wet, its result is most pernicious. It then serves only to fill up the pores and interstices of the earth, to compact it together into a comparatively solid mass, and to check that ready permeability to air and fluids which constitutes one of the most important points in good cultivation.

Passing from raking, and its almost necessary precursor, hoeing, it is natural to glance at the opposite course of weeding by hand, so as to avoid either. Hand-weeding is, without question, the most effectual way of ridding ground from any troublesome pest by which it may be beset. Yet, there is much danger here, too, of falling into error by pursuing it at improper periods or to an undue extent. The unsuitable seasons are when the weather is particularly wet, as it then leads to the trampling of the ground before condemned, notwithstanding that this is the time commonly selected for the process, on account of the facility with which weeds may be drawn out if the ground be moist; and likewise while extreme drought prevails, weeds not only being at that time difficult to extract, but endangering the displacement of small or delicate plants by their removal. What we mean by carrying on hand-weeding to an undue degree is, by allowing it to supersede the use of the hoe or any other implement which would stir and open the ground.

Those who have habituated themselves to notice the facts daily occurring around them, will have frequently observed that where a bed or group of plants has been freed from weeds and rubbish only by the hand, the specimens have invariably been sickly, simply for want of having the soil loosened around them. This is especially perceptible in those circles of annuals which are reared in flower borders, and from which both weeds and superfluous plants have been taken away by the hand. It is similarly observable in beds or masses of flowering plants reared from seed, or even in groups of transplanted sorts. Hence, to those who prefer hand-weeding in special and convenient cases, as a means of permanently clearing ground, we would strongly suggest the subsequent use of the hoe or small fork immediately around the plants, to give both an entrance and an outlet to those gases and fluids which may be useful or hurtful to the plants.

Whilst we are speaking of those operations which are to be governed chiefly by the state of the weather, or rather the continuous action of any one variety of it, we may as well allude to such as are still more entirely subjected to its control. These are planting, pruning, manuring, rolling, turning, or gravelling walks, sowing seeds, and collecting the same, destroying weeds, and a variety of others, which will occur to the mind of any reflecting cultivator. Not that we would affirm of any of these that they *cannot* be executed unless the weather be favourable ; but we would merely say that none of them can be satisfactorily and perfectly accomplished without regard being had to the condition both of the ground and the atmosphere.

As to planting, it is notorious that a period of dull, and cloudy, and rather damp weather, is preferable for it. And thus it is that the month of November, by being the dullest part of the year, is aptly regarded as the best month for the planter. We need hardly add that the philosophy of this selection consists in the opportunity a moist sunless season affords the newly-removed plants for recovering their power of absorbing moisture from the earth in sufficient proportion to the exhalations from their branches or leaves ; and also in the ease with which the exposed roots can be kept from drying during the progress of the transplantation. More importance attaches to this last fact than is usually conceded to it.

Pruning, again, is most safely carried on at those seasons in which the juices of plants are comparatively stagnant, and on such days as happen to be partially hazy or clouded, and free from frost. November is therefore the best month for this process, likewise, in the majority of cases. Dull days are calculated to promote the healing of the wounds, without that exhausting flow of sap which would attend a fervid sunshine. And in frosty weather the juices left exposed in the wounded part of a shoot become coagulated, and the destruction of the point of the branch is the consequence.

That manure is fittest applied in dry frosty weather to save the mutilation of roads, walks, or ground over which it is taken, will be clearly apparent. But that it is most prudent and philosophical to put it on in the end of autumn, will not be so obvious ; general practice being, in this instance, regulated more by convenience than by cogency of rational inference. The reasons which weigh in favour of the common mode of proceeding are, that, by lying in the ground all the winter, manure gets more blended and incorporated with its substance than it could do in summer, because of the preponderance of fluid, (which is the medium of assimilation), at the former period, and because, moreover, the peculiar gases of the manure will evaporate less through the winter.

Rolling must palpably be done after rain has moistened the walks or the lawn sufficiently to receive an impression, and while they are not too wet to have their surface injured by being trampled. Walks must plainly, too, be turned or gravelled in showery weather, for this is the time at which alone they can be made to set and bind again firmly and smoothly. The month of April is, for this reason, the most appropriate part of the year ; and it becomes additionally suitable from the fact that spring time is just opening, and worms have nearly ceased to disturb the surface, and peculiar neatness and freshness are demanded.

Seeds should be intrusted to the ground in dry weather, though it is of great moment that they should be visited soon after with gentle showers. The dryness at the time of sowing is essential to enable the operator to keep the ground open and porous on the top; for by trampling and raking it while wet, the seeds would be shut up, as it were, in a prison, and would not germinate at all readily. The advantage of subsequent rains is to soften and swell the different parts of the seed, burst its integument, and assist in developing its vegetative powers. The month of March is thus the one which Nature indicates as the seed-sowing time, since it is generally dry, and is followed by the genial showers of April. And the nearer all other sowings can be made to correspond with this in respect to the weather, the better chance will they have of succeeding. It is remarkable that seeds which have to lie a long time in the ground before the occurrence of congenial weather, never produce such fine or healthy plants as those which develop themselves immediately under favouring influences. And this fact should teach the cultivator to calculate as accurately as he can on the state of the weather which will follow his sowings, and even to put off any sowing which may be deemed necessary at a particular time until a prospect of suitable weather arrives.

In sowing seeds, the great art is to collect them just when they are dry and ripe in themselves, and likewise dry externally. A bright sunny day is the time for this. But it is of as much consequence to have the seeds hardened and dried by maturity, as it is to catch them free from moisture by rain or dew. Half the failures that are experienced with the seeds of annuals (and particularly of composite flowering kinds) are caused by collecting them before they are properly ripened, swelled, or even formed. The careful and judicious cultivator will attend as much to the one of these matters as to the other.

We must now quit this topic for a time. Our observations have perhaps been too minute, and dealt too much with well-known facts. Yet we feel that a worse fault would have been the superficial notice of the several questions, without entering into any. If details are tedious, they are also useful; the study of them has elevated many a man in the scale of society: no one has ever risen by their neglect.

And it is the same here with things as with persons. Attention to *trifling* circumstances is the secret of plant-culture.

FLORICULTURAL NOTICES.

NEW OR BEAUTIFUL PLANTS FIGURED IN THE LEADING BOTANICAL PERIODICALS FOR NOVEMBER.

ABU'TILON VITIFO'LIUM. "This fine Malvaceous plant is a native of Chili, whence it appears to have been introduced, about the year 1836, by Captain Cottingham, of Dublin. It was noticed in this work in July, 1840, when it was stated that it had proved quite hardy in Ireland, having stood in a south border, without protection, for three years. Under such circumstances it must be a noble-looking shrub, for it is said to maintain a stature of six feet, and to become one mass of blossom. With us in England it does not, however, prove fit for the open ground." The foliage is large, heart-shaped, with five or seven clefts, bluntly serrated on the margin, and somewhat hairy. Their outline approximating to that of the Vine, has obtained for the plant the name *vitifolia*. The flowers are collected into large clusters, and have an imposing appearance, measuring individually about three and a half inches across. They are very different from those of the well-known *A. striatum*, both in form and colour, the petals expanding flat and having a lilaceous tint. "It may be grown in a large pot or tub, but where it can be planted out in a conservatory bed, it will succeed much better. The soil most suitable is heath-mould, mixed with silver sand. Being a greenhouse plant, air should be given at all times when the weather is favourable, and it must be exposed as much to the light as possible. It is propagated from cuttings in the usual way. The worst of the plant is, that it occupies a great deal of room, and therefore can only be grown in large houses, and it is, like all its family, a favourite resort of the red-spider. When, however, the first is of no consequence, and the second can be kept down, it is well worth growing; for we have few plants whose flowers form such broad gay masses." *Bot. Reg.* 57.

ANGULOˋA UNIFLOˋRA. Concerning this beautiful and deliciously-scented species, Dr. Lindley writes as follows :—"We some time since announced the appearance in this country of a new species of the long-lost genus *Anguloa*, concerning which so many mistakes have been made. We are now able, by the kindness of Mr. Barker, of Birmingham, to publish the very *Anguloa uniflora* itself, which he was so fortunate as to flower in April last. We believe he received it among Linden's collection in Columbia; according to Ruiz and Pavon, it is found in precipitous places about Muna and Chincao in Peru, and profusely in the woods of Tarma, where it is called Carpales. It is a sweet-scented plant, with large white flowers, slightly tinged with yellow, and the whole habit of a *Lycaste* to which genus this approaches very nearly." The genus commemorates Don Francisco de Angulo, Director-General of the Peruvian mines, and greatly attached to botanical pursuits. (This is the species noticed from Mr. Rucker's, in our August Number, p. 166). *Bot. Reg.*, 60.

ANŒCTOCHIˋLUS SETAˋCEUS. "One of the most exquisitely beautiful of all plants in the hue and marking of its leaves, not to be imitated by art. Their colour is of a rich velvety green, tinged with copper, and over that appears to be laid an exquisite golden net-work; the underside is quite different, of a reddish tinge, with obscure yellow veins, but all that is most beautiful is exposed to view. It is a native of damp, shady woods in Ceylon, Amboyna, and Java, and probably of the Indian Islands generally." Sir W. J. Hooker thinks there can be no doubt that this species is synonymous with the *Chrysobaphus Roxburgii* of Wallich, from Sylhet and Nepal. *Folium petiolatum* is also given as the name adopted by Rumphius in the "Herbarium Amboinensis." Two distinct varieties are cultivated in gardens; one having the whole surface of the leaf as described above, and the other, which is certainly the less beautiful of the two, having a dash through the centre of a much lighter and greener colour, and the golden net-work less strongly defined. In habit they bear a great resemblance to the old *Goodyera discolor*, having a creeping stem, and the leaves wholly confined to the lower part of the plant. The flower-stem rises about a span high, bearing five or six flowers in a spike at the top, which, though remarkable in their structure, are inferior in point of attractiveness to the foliage. The sepals are of a green hue, tinged with red, and the petals white, tipped with the same colour. The lip is the most interesting portion, being large and pure white, with a fringe of white hairs at the margin, and a curious conical pouch at the base. The generic name is supposed to allude to the spreading of the lip, and to be derived from the Greek, *anoictos*, open, and *cheilos*, a lip. It requires a greater uniformity in the moisture of the surrounding atmosphere, than the generality even of Orchidaceæ—a state which is mostly maintained by covering the surface of the soil with growing hypnum moss, and inclosing it in a bell-glass. *Bot. Mag.* 4123.

ARISTOLOˋCHIA ORNITHOCEˋPHALA. "There are few plants which present more striking peculiarities of form and structure in their blossoms than the various individuals of the genus to which the present plant belongs. Ninety-two species are enumerated by Steudel, in the new edition of his valuable "Nomenclateur Botanicus." Amongst them is a peculiar group, inhabiting Brazil, which Martius characterizes as having flowers of a remarkably large size, variegated with dark purple-brown, with the tube of the perianth obovate or ventricose, the limb tubular at the base, then two-lipped; the upper lip more or less elongated, channelled, the lower one from a very contracted and channelled or cymbiform base, dilated into a very broad lamina." The present species, with several others, amongst which are *A. galeata*, and the well-known *A. labiosa*, belongs to this division. To both of these species, just mentioned, it is nearly allied. It may, however, be at once known from the latter by "the very narrow (not broad and cymbiform) base of the lower lip. From *A. galeata* it may be discriminated by the greater size of its leaves and flowers, by the different colour and marking of the perianth, and especially by the deep sinus of the great lamina of the lower lip. It was raised in the Glasgow Botanic Garden from seeds gathered near Crato, Brazil, by Mr. Gardner, in September, 1838. Plants communicated from Glasgow to Mr. Moore, at the Glasnevin Botanic Garden, produced their curious blossoms in the stove during the autumns of 1840 and 1841." It is a climbing shrub, of a luxuriant habit, and should be planted in a border, and the shoots trained to the rafters, to show the flowers to advantage; it may also, however, be grown and flowered in a large pot, with the branches twisted round a wire trellis. It requires a stove temperature. The flowers are large and handsome, of a dingy yellow colour, variegated with black purple reticulations. *Bot. Mag.* 4120.

Chiri'ta sine'nsis. "This charming little greenhouse plant is one of the first results of any importance, from the voyage to China by Mr. Fortune, on account of the Horticultural Society. It was sent home in a wooden case, and its beautiful large, lilac, foxglove-like flowers were open when it arrived. Those who see what this is, may judge how desirable it would be to obtain from India the other species of the genus, among which are some still finer. And they are all so easily cultivated, that they are just the things to introduce into gardens. Anybody who can grow a *Gloxinia* can manage a *Chirita*." It is a stove plant, and may be propagated by the leaf like a *Gloxinia*. *Bot. Reg.* 59.

Echinoca'ctus Pentla'ndi. "This is a very pretty species, more remarkable for the rose-red colour of the flowers, than for any other striking peculiarity." It is in the Kew Gardens, but nothing whatever is known of its history. The plant is nearly globular, about two inches across, slightly depressed at the top. The ribs are distantly beset with little woolly tufts, from which rise six stout and somewhat curved spines about half an inch long. "The flowers are large in proportion to the size of the plant, and spring from the sides of the ribs, solitary, but three or four are expanded on one specimen at the same time." *Bot. Mag.* 4124.

Gesne'ria Gardne'ri. "Discovered by Mr. Gardner on the Organ Mountains of Brazil, in March 1841, growing two to four feet high in rocky places; and raised from seeds, sent over to Mr. Mackay, at the College Botanic Gardens, Dublin, where it produced its handsome flowers in July, 1844. It is very distinct from any species hitherto described, and remarkable for the thick and fleshy leaves, shaped not unlike those of the Elm, pale coloured, and with prominent nerves beneath." The species is not so handsome as many in cultivation. *Bot. Mag.* 4121.

Ho'vea ilicifo'lia. "This is one of the less attractive species of the genus, for which we are indebted to Robert Mangles, Esq., who raised it from Swan River seeds, and flowered it last April. It cannot be the *Plagiolobium ilicifolium* of Sweet, if that plant is rightly described with a downy pod, for this has one perfectly smooth. At all events, it is most certainly a *Hovea*, and the species named by Allan Cunningham *ilicifolia*, as is proved by one of his specimens from King George's Sound. It is a greenhouse shrub, requiring the same treatment as *H. Celsi*." *Bot. Reg.* 58.

Hydra'ngea japo'nica. "Japan seems to abound with Hydrangeas, Siebold having described as many as fourteen from that country. In this respect, as in many others, we have the indication of a near relation between the flowers of Japan and North America. It does not, however, appear that they are very handsome; and in this respect too, they agree with the American species, with the exception of *H. Otaksa*, which seems to be hardly different from *H. hortensis*. The greater part of them are like this, and some are not so pretty. The most interesting among them are *H. Belsonii*, a plant with the habit of *H. arborescens*, but with large blue flowers; and *H. stellata*, whose barren flowers are double, and light-blue or pink. According to Siebold, this *H. japonica* has two varieties, called *Benikaku*, with rose-coloured flowers; and *Konkaku*, with pale-blue flowers. It does not grow more than two feet high at the most, branched from the very bottom. The Japanese cultivate it commonly in their gardens. It is found wild on the mountains of Nipon." It is a hardy shrub, requiring similar management to *H. hortensis.* Mr. Low, of Clapton, imported the first specimens to this country. *Bot. Reg.* 61.

Myoso'tis Azori'ca. "This beautiful *Forget-me-not* is found about waterfalls, and on wet rocks with a north-east aspect, in the islands of Corvo and Flores, the most westerly of the Azores. Its proper habitat appears to be on the mountains, though it comes down nearly to the sea-shore, following the course of rocky mountain streams, where the atmosphere is kept humid by the spray of the water. The deep rich blue of its numerous flowers, and their long succession from the lateral branches, combine to render this species well deserving of cultivation, providing it can be brought to flourish in the drier climate of our gardens. It will require a loose, peaty, or sandy soil, careful shading from the mid-day sun, frequent sprinkling with water, and to be covered with a glass in hot dry weather. It will bear some frost, but may likely prove more impatient of cold than our native species of the genus." The flowers are about equal in size to those of *M. repensor sylvatica*, of a deep indigo blue colour, slightly tinctured with purple when they first expand. It comes nearest to *M. palustris* in general appearance, but has many distinguishing features, different from all the European species. *Bot. Mag.* 4122.

OPERATIONS FOR DECEMBER.

Although the more active duties which spring and summer entail on the culturist are for a time suspended, there are duties peculiar to the winter that are scarcely less important, and which are continually demanding consideration and care. The constantly varying weather, the alternation of a dark foggy and a bright clear atmosphere, the sudden depressions and rises of temperature, require him to be incessantly on the alert.

A season of torpidity in plants growing in houses, as well as in those in the open ground, which are provided with it naturally, is almost as much an essential to their successful cultivation as the renewal of soil and the appliance of warmth and moisture in summer: and though some species appear to flourish under continual excitement, these form but a very small exception to the general rule. And that this state of repose should, in all cases where the nature of the plants will allow, be promoted to the utmost extent in the short days of winter, appears to be not only a furtherance of the results desired to be obtained, but also of some importance as an economical consideration. Growths made in winter are always less vigorous and perfect than those formed in summer; and a plant in a growing state requires a greater degree of warmth, and, consequently, a greater expenditure of fuel, to preserve it from injury.

The proportion of warmth and light in winter being naturally decreased, every possible means should be embraced to diminish both atmospherical and terrestrial moisture in an equivalent ratio. And if the growth of the plants be stimulated in spring, encouraged through the summer, and then gradually brought to rest during autumn, at this period of the year they will be in a fit condition for the most rigorous application of this principle. To put this in practice, the cultivator ought always to have perfect command over the humidity of the atmosphere, as well as its temperature. Houses, therefore, should always be so elevated as to afford every facility for the draining away of moisture, especially when erected in low or naturally moist situations; and every channel by which humidity is communicated should be cut off. Many sources are often unsuspected or overlooked, which it may be well to advert to: such as leaving cisterns of water uncovered, unconfined fermenting materials, or any careless application of water. Moisture, too, is frequently engendered by suffering plants or weeds to grow under the stages or shelves on which the plants are arranged; and admitted by insufficient care in rendering the roof water-tight. All feeders, too, which may have been placed under the pots, should be removed.

The degree, however, to which it will be advantageous or even safe to extend this, will require modification to meet the exigencies and peculiarities of different kinds of plants. In the Orchidaceous house, whilst the major part succeed best with a cool and dry atmosphere, it is necessary to afford a little more warmth and moisture to the Vaudeous section. In the other stoves, there are many South American and other species which flower in the winter, or late in the autumn, and which consequently require more moisture and warmth than such as complete their growth earlier; and as the number of winter-flowering plants is so limited, wherever the tendency to flower is manifested it should be encouraged, in preference to the rigid repose needed by the majority. Such plants should always be set apart from the others where there is convenience for it. The greatest aridity and exemption from watering will scarcely prove injurious to the species of *Mammillaria* and *Echinocactus*, or, indeed, to any cactaceous plants. *Aloes*, *Mesembryanthema* and *Stapeliæ* should also be very cautiously and sparingly watered, and need little more heat than is sufficient to preserve them from frost.

No favourable opportunity of giving air should be neglected. A close, pent-up atmosphere, is most injurious to plants at this season, and should never be prolonged beyond what is unavoidable in consequence of the state of the external air. In foggy or rainy weather, when the atmosphere is loaded with moisture, it is better to keep all plant structures closed ; but in clear dry or sunny weather, if there is no frost, the ventilators of the greenhouse should remain open throughout the day. Stoves must also be ventilated, but more sparingly. Plants in pits and frames are more liable to suffer through excess of moisture than those in houses ; the lights must therefore be opened so as to cause a regular but gentle draught to pass through. Very cold or rough winds must be guarded against.

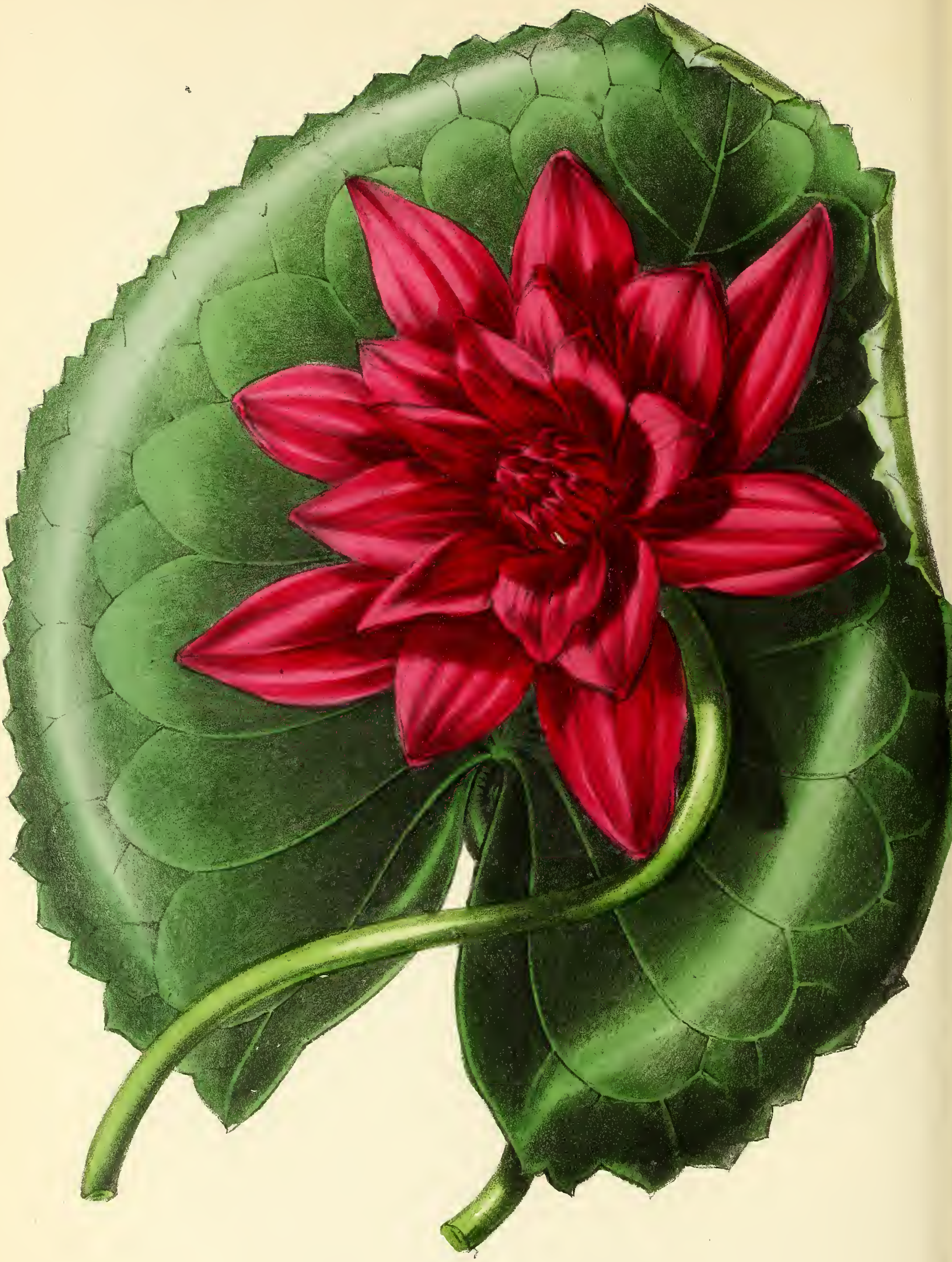
Where a greenhouse or stove is furnished with a shade attached to a roller, a great saving of fuel will be effected by drawing it down over the glass in cold weather, and especially when accompanied by winds. A saving of full six or seven degrees of heat, if not more, will thus be obtained at much less trouble than would be necessary to maintain it by fire, and is, moreover, less injurious to plants. If a somewhat stouter material be made use of than that ordinarily employed for shading, the saving of heat will be much more than above stated. Houses devoted to Cape Heaths should always be provided with a covering of this kind in winter, as the plants are very impatient of fire-heat. Straw mats constructed of the same dimensions as each light, are amongst the best protecting materials for pits and frames, and may be made by labourers in wet or stormy weather.

The forcing-house must now be kept in active operation. Tree Pæonies, Persian Lilacs, Deutzias, and all hardy plants intended for forcing, should be placed in a cool frame or greenhouse, for a few weeks, before they are subjected to a higher temperature. Few plants have a more truly ornamental effect when well managed in forcing than Chinese Azaleas, and Rhododendrons, especially the hybrid varieties of *R. arboreum.* None of them, however, will bear to be rapidly accelerated without suffering a serious diminution in the beauty of the flowers ; they must therefore be excited slowly and gradually. The latter require to be liberally supplied with water, and should have the foliage damped frequently with a syringe. Keep the glass perfectly clean, in order to get all the light possible ; for this is an important point in forcing.

In all plant receptacles a scrupulous attention to clearing away dead stalks, leaves in a state of decay, and any parts affected with mouldiness, cannot be too strictly enforced. The green mosses too, which grow rapidly at this season on the surface of the soil, should be removed from time to time, more particularly in the frames, where, owing to the usually greater humidity of the air, they spread faster, and prevent the soil from drying.

Now that all the leaves are fallen from the trees, advantage should be taken of dry days to collect them together, and lay them up in heaps in the compost ground to rot ; or if a gentle heat is required to bring a few plants forward in any of the pits having a trench round the outside, they may be employed for that purpose, observing to cover them over securely, that they may not blow about, and again bestrew the garden. When well decomposed they form a mould the most valuable of all ingredients in composts, either for potting, or enriching the borders. Where they are plentiful they may be dug into the shrubbery-borders at once ; and in this state are more useful to stiff adhesive soils in improving their mechanical texture, than when applied in a thoroughly decayed condition.

Whatever alterations are necessary in any part of the pleasure ground they should receive immediate consideration, and be hastened as much as possible ; for it is bad policy to have these to interfere at a later season with the timely despatch of the numerous operations which will soon demand the entire attention. Planting and pruning may still be performed, if not already completed. Collect soils for potting, and always have a sufficiency under cover from the weather, to be ready for any casual want. Tropæolums showing renewed signs of growth may be potted, but must have little water for some time after. Gladiolæ, Watsonias &c. must be potted and placed in a cold frame, if not yet done.



S. Holden del & lith.

Nymphæa rubra.

NYMPHÆA RUBRA.

(Red-flowered Water-Lily.)

Class.
POLYANDRIA.

Order.
MONOGYNIA.

Natural Order.
NYMPHEACEÆ.

Generic Character.—*Calyx* four or five-leaved, girding the base of the torus. *Petals* sixteen to twenty-eight, adnate to the torus, elevated above the ovary, and covering the same, and therefore at first sight appearing inserted in it. *Stamens* numerous, disposed in many series, inserted in a similar way above the petals.—*Don's Gard. and Botany.*

Specific Character. — *Plant* a smooth aquatic perennial. *Leaves* floating, on long cylindrical footstalks, petiolate, toothed: under surface immaculate, and pubescent with prominent radiating veins. *Flowers* three to five inches wide. *Petals* purple, unequally formed.

Synonyme.—*Castalia magnifica.*

We may safely aver that, among the fine family of Water Lilies, few of the tropical kinds are more specious, or admit of culture more conveniently than *N. rubra.* The flowers certainly are a little inferior in dimensions to those of some of its congeners—though often much larger than our figure—but the intensity of their rich crimson-purple petals, and the smaller and less exuberant character of other parts, is more than a sufficient compensation.

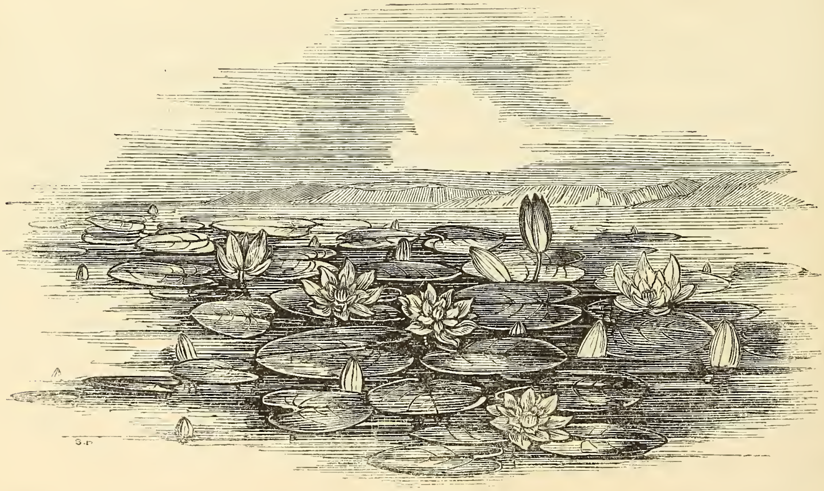
It is an oriental species, existing plentifully in Hindostan, where it is found growing in pools of fresh water, and not unfrequently in gently flowing rivers. The stem grows horizontally amongst the mud, protruding numerous fibrous roots all along its surface. The leaves are elevated on long stalks, and float on the surface of the water, their numbers increasing so rapidly in the growing season, as in a short time to form a beautiful olive-green carpet; and when this is studded over with the richly coloured blossoms reclining on the bosom of the water, it must form a most lovely picture. But it is not alone for the beauty of the flowers that the plant is sought. The seeds are considered to form a wholesome and nutritious food, and are much esteemed by the natives, who eat them either in a raw state or boiled. In times of scarcity, other parts of the plant, especially the roots, are also eagerly sought after by the poorer classes. The flowers are said to be regarded with a superstitious veneration.

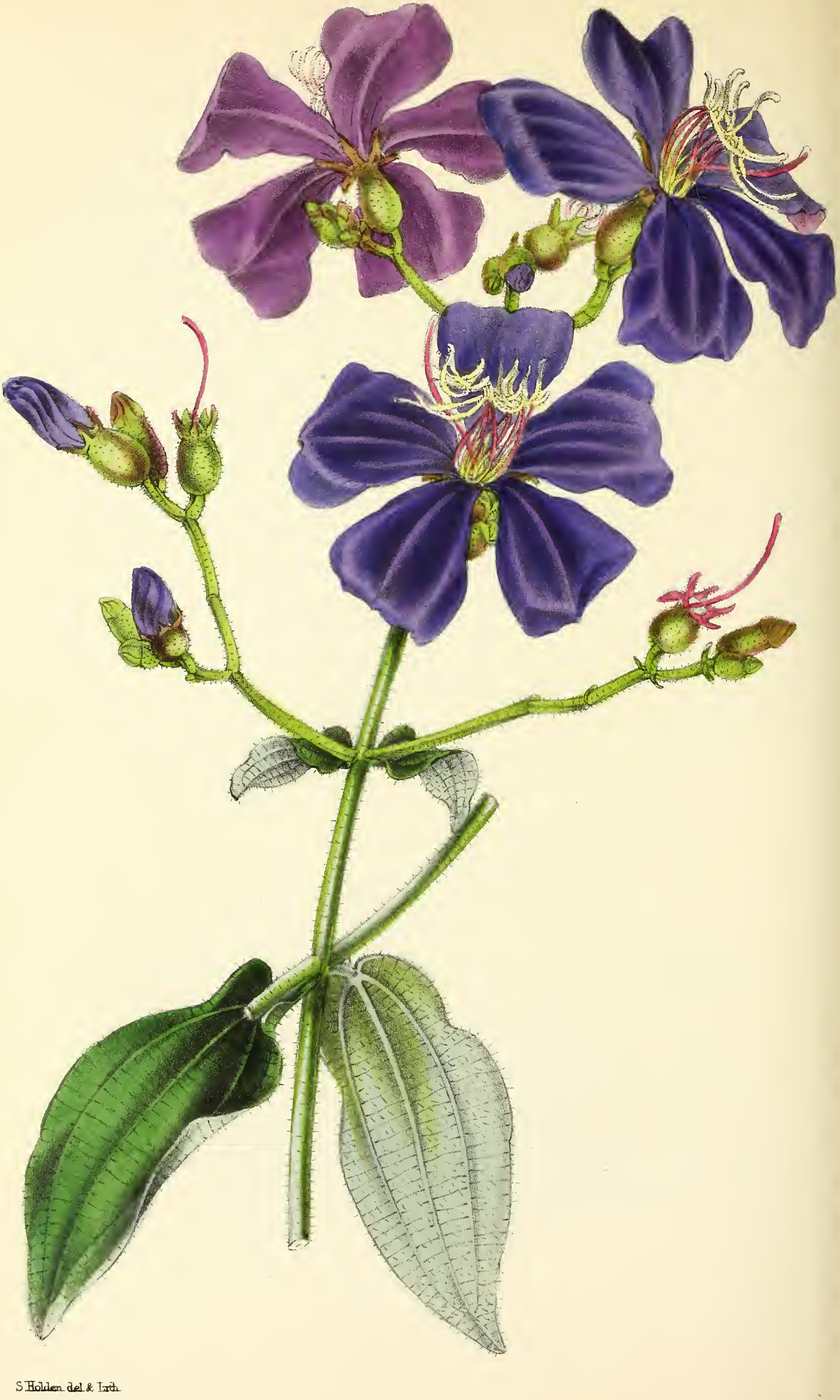
We are indebted for its introduction to the late Sir Joseph Banks, Bart., who brought seeds to England about the beginning of the present century. That it is yet a scarce plant and rarely flowered, is probably in a great measure owing to the facts of its being a stove species, and the little regard paid to the cultivation of aquatics.

The want of success in the management of stove species of Water-plants, is a common complaint even amongst the few interested in them; and mainly consequent, we believe, on the neglect of a very simple condition. It must be evident to all who have any conception of a tropical climate, that a degree of warmth will be communicated to a still or only slightly agitated water, far surpassing in degree that produced by mere contact with the atmosphere of an ordinary stove. To enable tropical aquatics, then, to flourish with the desired vigour, this desideratum must be overcome; and in limited collections, where an aquarium separate from the miscellaneous stove is impracticable, the most convenient practice will be to place the tank or tub in which the plants are grown immediately over the heating apparatus. Perhaps the tank-system of heating affords the greatest facility of commanding a genial warmth.

A quantity of loamy earth should be spread in the bottom of the tub or tank for the roots to fix themselves in; and in the winter season the water should be drained off to its surface. But the earth should be constantly kept in a somewhat lutulent state, and must on no account be ever suffered to become quite dry.

Our embellishment was obtained through the courtesy of Mr. Knight, from a specimen which flowered last August, in a small wooden cistern, in one of the stoves of that gentleman at the Exotic Nursery, Chelsea.





S Holden del & Lith

Pleroma petiolata

PLERÒMA PETIOLÀTA.

(Long-petioled Pleroma.)

Class.
DECANDRIA.

Order.
MONOGYNIA.

Natural Order.
MELASTOMACEÆ.

Generic Character.—*Calyx* with an ovate tube; when young involved in two deciduous bracts; lobes five, deciduous. *Petals* obcordate. *Stamens* ten. *Filaments* pilose or glabrous. *Anthers* elongated, arched at the base. *Ovary* adhering to the calyx, apex bristly. *Capsule* baccate, subsiccate, five-celled. *Seeds* cochleate.

Specific Character. — *Plant* an erect evergreen shrub. *Stem* bluntly tetragonal, hairy. *Leaves* opposite, oblong-lanceolate, nearly cordate at the base, acute at the apex, petiolate, entire, densely pubescent. *Inflorescence*, in terminal corymbose panicles. *Peduncles* axillary. *Flowers* numerous. *Petals* obovate-cuneate, emarginate, ciliated. *Anthers* armed, ascending. *Filaments* pilose. *Style* smooth.

Synonyme.—*Lasiandra petiolata.*

In accordance with Mr. Bentham's views of the unity of *Lasiandra* and *Pleroma*, we have adopted the latter name, although the subject of our drawing, from its pilose filaments, would have been more fitly arranged with the former, had the difference of generic characters been deemed sufficient to retain that section as a separate genus.

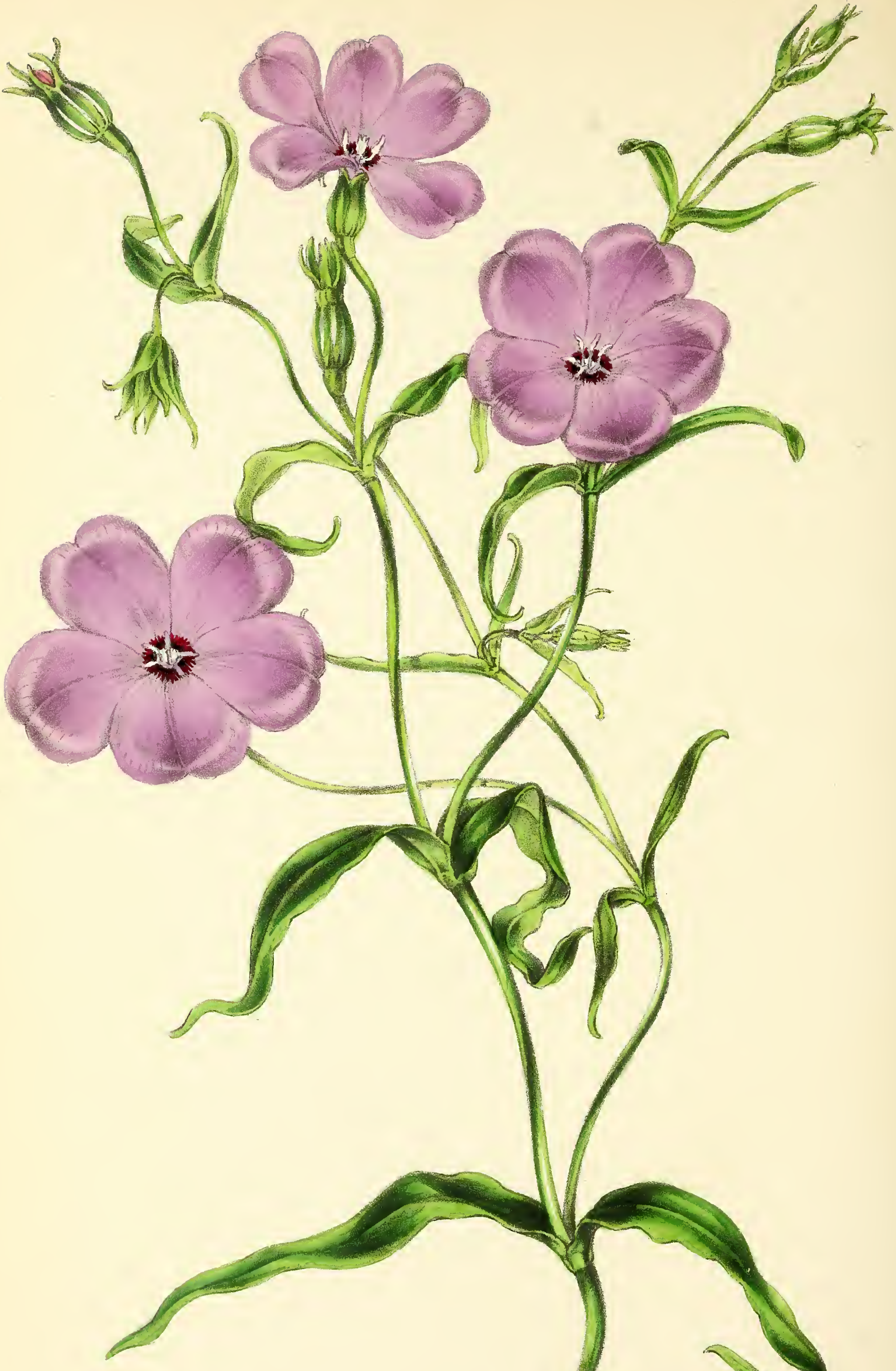
All the species are natives of South America, and have large showy purple flowers, which are commonly concealed in a pair of deciduous bracteas before they expand, and are arranged in large terminal panicles. The present plant is a strong growing shrub, generally rising three or four feet high, and sometimes even attaining a still greater altitude. The branches are well furnished with handsome foliage of the same soft velvety character, so frequent amongst Melastomaceous plants. It remains in flower for a considerable period, developing its blossoms in succession.

It was first known in Britain through plants in the Edinburgh Botanic Garden, which were procured in 1836 from the Botanic Garden of Berlin. Sir W. J. Hooker suspects it to be synonymous with *L. Maximiliana*, a native of the provinces of Saint Paulo, and Saint Sebastiano, in Brazil, where it was collected by Prince Maximilian de Neuwid, and named after him by Martius.

In common with most other plants of the same tribe, it succeeds best in a mixture of rich friable loam, peat-earth, and sand; and being a vigorous growing species, should be supplied with a tolerably roomy pot and abundance of water during the period of growth. In conjunction with these, a stove heat and a humid atmosphere are equally essential. If stinted in their supply of nourishment, the plants speedily assume a sickly aspect, and become naked at the bottom from the loss of the lower leaves. Increase is readily effected by preparing cuttings of the young wood, and inserting them in small pots filled with a sandy peat earth, and supplying them with a gentle bottom-heat.

Our drawing was procured through the permission of Mr. Knight, of Chelsea, from a plant which flowered at the Exotic Nursery last August. A fine specimen also bloomed at Mr. Lowe's, Clapton, about the same period.

Pleroma is a Greek word, signifying *fulness*, and has been applied to the genus in allusion to the cells of the capsule.



S Holden del & Lith

VISCÀRIA OCULÀTA.

(Dark-eyed Viscaria.)

Class.
DECANDRIA.

Order.
PENTAGYNIA.

Natural Order.
SILENÀCEÆ.

Generic Character.—*Calyx* cylindrical, clavated at the apex, five-toothed, naked. *Corolla* of five petals, unguiculated, with scales at the throat. *Stamens* ten. *Filaments* filiform. *Anthers* two celled, dehiscing longitudinally. *Styles* naturally five. *Capsule* five-celled, very rarely three or four-celled. *Seeds* numerous, minute, reniform, granulated or tuberculated. *Anthophorum* long.

Specific Character.—*Plant* an annual, with numerous spreading branches. *Leaves* lanceolate. *Calyx* tube abruptly constricted below the middle. *Petals* with a short notch, rose-coloured with a dark eye at the base. *Capsule* granulated, ovate.

Synonymes.—*Lychnis oculata, Lychnis aspera.*

Seeds of this beautiful annual were gathered two or three years ago, in the neighbourhood of Algiers, by Mr. Giles Manby, who presented them to the Messrs. Backhouse, Nurserymen, &c., at York.

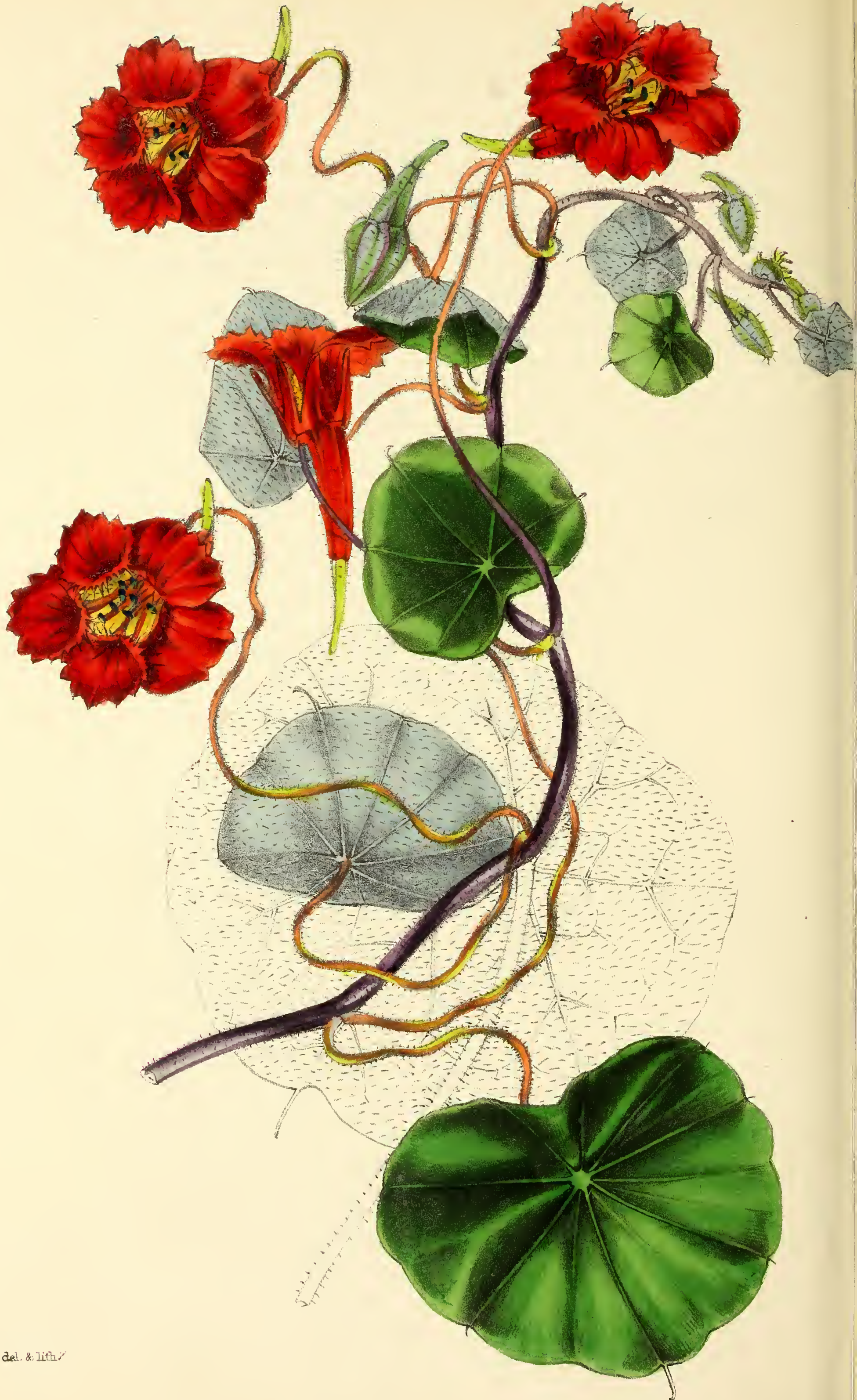
The plant has much the character of *Lychnis cœli-rosa* (now *Viscaria cœli-rosa*); but whilst that species has flowers with a much paler centre than the margins, those of *V. oculata* are just the reverse; and the specific name was suggested by the dark and brilliant spot which occupies the borders of the throat. It is also distinguished by other, but less conspicuous features.

The colour and size of the flowers vary considerably in different plants, some producing blossoms of twice the magnitude of those exhibited by others, and of tints graduating between a pale and watery pink, and a deep rich rose-colour. This natural inclination to deviate from an uniform character, might perhaps be turned to a useful account, by crossing the species with some of the scarlet flowering *Lychnis*. The probability of obtaining both a superiority of size, and richer colours, renders the experiment well worth trying. Being an annual, however, there will be greater hazard of acquiring an improved variety with stability of character when reproduced from seed.

The remarkable fecundity of the species, and the complete maturity which the seeds attain in the open border, have rendered it already of comparatively easy attainment, almost any nurseryman being able to supply it. Our artist made the drawing now furnished, last June, from plants in the possession of Messrs. Whitley and Osborne, Fulham.

It is a very useful plant for beds in the flower-garden, or patches in a shrubbery, where, from its wide-spreading and ramifying character, it soon forms a dense covering. Sown in autumn and kept in a dry part of the greenhouse through the winter, it makes a serviceable acquisition in early spring. It grows freely in any common garden soil, and will thrive in almost any situation ; it seems, however, to succeed best in somewhat dry and sheltered places.

The genus was separated from *Lychnis* by Roëhler, and the name *Viscaria*, —founded on the Latin, *viscus*, birdlime—has reference to the adhesive, glutinous matter which covers the stems of some species.



S.Holden del. & lith.

TROPÆOLUM LOBBIÀNUM.

(Mr. Lobb's Indian-Cress.)

Class.
OCTANDRIA.

Order.
MONOGYNIA.

Natural Order.
TROPÆOLÀCEÆ.

Generic Character. — *Calyx* five-parted; upper lobe spurred. *Petals* five, unequal; three lower ones smaller, and evanescent. *Stamens* eight, free from each other at the base. *Carpels* three, sub-erose, kidney-shaped, indehiscent, furrowed, roundish. *Seeds* large, without albumen, attached to the cell, and conforming to it in shape. *Embryo* large. *Cotyledons* two, straight and thick.

Specific Character.—*Plant* a twining, herbaceous perennial. *Stems* hairy. *Leaves* on long flexuose footstalks, orbicular, obscurely lobed, peltate; lobes with a soft mucro at their apex. *Peduncles* axillary, very long, flexuose, apparently climbing. *Calyx* deeply five-cleft, prolonged at the base into a broadly subulate spur, nearly straight, and thrice the length of the calyx; segments ovate-oblong, erect. *Petals* five; two upper ones large, broadly obovate, obscurely three-lobed at apex; lower ones nearly similar in form, smaller, but upon long claws. *Laminæ* deeply and coarsely toothed, lower part fringed at the margin.

Synonyme.—*T. peltophorum.*—

Messrs. Veitch and Sons, of Exeter, who have been instrumental in obtaining so many beautiful plants from South America, through their collectors, have also had the pleasure of introducing the charming species of *Tropæolum* portrayed on the opposite page.

In the "Plantæ Hartwegianæ" we find Mr. Bentham has given the name *T. peltophòrum* to a species found by Mr. Hartweg in fields near Loxa, the description of which, with the single exception of being called an annual, is perfectly applicable to *T. Lobbianum.* This species is decidedly a perennial, but it seems likely, nevertheless, that the same plant is intended; and if so, his name, being prior to this,—which has been published in the *Botanical Magazine* by Sir W. Hooker—ought to take precedence of it.

Seeds gathered by Mr. Lobb, in Colombia, and forwarded to Messrs. Veitch and Sons early in 1843, were sown immediately after their arrival, and soon produced healthy plants, which grew vigorously and flowered in the following November. The same plants produced blossoms again early last June, and have continued to flower during the remainder of the summer. The drawing was taken from a well-flowered specimen obligingly furnished to us by those gentlemen in August.

It bears considerable resemblance to *T. Moritzianum,* both in habit, foliage, and flowers; but is, nevertheless, easily distinguished by the less obviously distinct lobes of the leaves, and by the hairiness of all its parts. The flowers, too, are of a brilliant orange-scarlet, which our plate can make no pretensions to equal; and though the petals are not entirely free from the fringes which are so prominent in *T. Moritzianum*, they are much shorter and less numerous.

The addition of this and other perennial species of great beauty lays open a broad field for the exertions of the hybridist. We have the old annual Nasturtiums of various colours; and in our present plant we have an herbaceous species with a good habit, and flowers of great brilliancy. Why not endeavour to combine the large size of the blossoms of the former, or the deep blood-colour of one of its varieties, with the perennial nature and less rambling vigour of the latter?

One of the most ornamental methods of training, is to spread the shoots over a wire trellis, such as is commonly used for other similar species. They may also be twisted round an umbrella-shaped trellis till they reach the top, and then continuously turned upon it, till they commence flowering, after which they should be allowed to extend themselves in a pendant position over the edges. To produce a plentiful show of flower, it will, however, be necessary to encourage growth very early in the spring.

The specific name was given by Messrs. Veitch and Sons, as a trifling acknowledgment of the services of the gentleman whose discrimination and exertions as a collector have been so eminently successful.

FLORICULTURAL NOTICES.

NEW OR INTERESTING PLANTS RECENTLY IN FLOWER AT THE PRINCIPAL SUBURBAN NURSERIES AND GARDENS.

Aphela'ndra aurantia'ca. At the Nursery of Messrs. Henderson, of Pine-apple Place, this magnificent plant has recently displayed its beautiful deep and very bright orange-red blossoms arranged decussately in a large terminal spike. The stems are stout, and clothed with large ovate leaves of an intensely deep and glossy green, and somewhat more drawn out at the point than those of its well-known congener, *A. cristata.* It will be an invaluable addition to the list of winter flowering stove-plants. Messrs. H. obtained it from a continental nursery.

Bego'nia ramenta'cea. One of the handsomest species of *Begonia,* and remarkable for the numerous depressed scales which cover the flower stem, the footstalks, and the whole under-surface of the leaves. The foliage is ample, bright green above, and of a sanguineous hue beneath. It was originally introduced from Brazil, four or five years ago, by Messrs. Young, of Epsom. A specimen was flowering recently in the nursery of Messrs. Jackson, of Kingston, and we have also seen it at several of the metropolitan nursery establishments during the past season.

Co'rræa, *hybrids.* A very extensive collection of seedling varieties of this genus are blooming at the Nursery of Mr. Gaines, Battersea, amongst which are several striking improvements upon those already in general cultivation; and others, which though certainly in advance, are scarcely sufficiently so to merit distinctive appellations. There are pink, rose-coloured, crimson, cream-coloured with a tinge of green, and bicoloured varieties, some of which have the wide-spreading limb of *C. alba,* whilst others possess more of the character of *C. Harrisii* and *C. speciosa.* Besides the novelty exhibited in the flowers, there is also a manifest superiority in the habit and foliage; the latter being considerably larger, and in many cases approaching a circular form.

Drymo'nia ———? Mr. Loraine, of Wallington Lodge, has recently flowered a new plant known in some collections as *Columnea zebrina,* which if not constituting a new genus, probably belongs to this, or *Alloplectus.* It is a somewhat succulent plant, with large, shining, obliquely ovate leaves, and flowers springing from their bosom, three or four together. The latter are conspicuous for the contrast between the dark-brown coloured calyx, and the sulphury yellow of the tubular corolla. The whole external surface of the corolla is covered with densely arranged villi.

OPERATIONS FOR JANUARY.

The rigorous weather we usually experience in January renders it a matter of paramount importance to maintain every advantage—as well in the internal state of plants as in the protections that surround them, which can minister to their security from harm. More plants are, perhaps, lost in this month than in any other, and it is especially trying to such as are of a weak or an easily excitable nature.

In all cases, then, where a premature tendency to commence growth is evinced, it should be suppressed as much as is consistent with the peculiar character of the individual; and this is more particularly requisite of those plants which are preserved in frames and pits, unprovided with means of protection from frost beyond what is afforded by external coverings. As a means of preventing unnatural excitement, the cultivator must be ever watchful to remove the mats, straw, or other protecting materials, as soon as the state of the weather renders it unnecessary for them to remain. This step is too often considered immaterial; but is in reality one of the most essential characteristics of superior management; and its neglect the precursor of many of the losses sustained at a more advanced period, and wholly owing to its tendency to render the plants more susceptible of injury from cold. Air must be given largely whenever practical; and it is a wise precaution to be very suspicious of any apparent necessity for administering water. Very little moisture, indeed, is absolutely needful under ordinary circumstances; and an overabundance entails the most disastrous consequences. The modern practice of placing frames with a northerly aspect, is a great promoter of a quiescent state, in saving the plants from the rousing power of the sun in the early months of the year.

In the greenhouse the same course should be diligently adhered to, and whenever it becomes indispensable to kindle a moderate fire, it should be borne in mind that any large amount of heat, beyond what is sufficient to keep out frost, is highly mischievous. Succulents may stand almost dry for the next six weeks, or two months; and must be carefully guarded from water dropping from the roof. The paucity of flowers at this season renders it the more necessary, too, to be scrutinous in maintaining the most exact neatness.

It will be impossible to repress every manifestation of growth in the Orchidaceous house, without some degree of injury: nevertheless, those as yet beginning to grow are rather the exception than the rule; and it will, therefore, be advisable, wherever there is suitable convenience, to remove them to a somewhat warmer house, and in the absence of other receptacles, many may safely be removed to the forcing-pit. Several Oncidia, Cœlogynes, and Dendrobia, as well as casual specimens of a few other genera, that were dried off early in autumn, will now have their flower-buds beginning to swell, and as these will be useful for the show-house, and drawing-room, it will be advisable to encourage them. The Vandeons section, also, will be benefited by a somewhat greater warmth; and when there is only one compartment, they should have the benefit of the warmer end of the house. A temperature of 55° by night, and rising to 60° or 65° during the day, is heat sufficient for the major part of Orchidacea.

If the object of the cultivator be to increase his Orchidaceæ rather than to flower them, a considerable increase of warmth and humidity may be maintained with impunity; but when flowers also are desired, the above practice will be the surest guide to their attainment. A vigilant eye must be kept over young growths to preserve them from damp and mouldiness, which are apt to destroy them at this season.

In the stove several Gesneraceous plants will be exhibiting signs of renewed activity. Towards the middle of the month, these, as well as many other similar plants likely to flower soon, such as Amaryllideæ, may be repotted and encouraged at once. *Tropæolum* tubers, which have begun to sprout, may also be potted and placed in a warm situation, observing to keep the soil rather dry for two or three weeks.

If the creepers and climbers in the different plant structures have not already been pruned and trained within proper limits, the work ought to be forwarded at the earliest opportunity, in order to afford all the light possible to the plants in the lower part of the house. A system of close pruning is of great advantage to most stove climbers; it must, however, be regulated and restrained by a due observance to the gracefulness and beauty of the specimen, without which no amount of bloom will be pleasing. Before the plants are again attached to the rafters, it will be proper to wash the latter well with soft soap and warm water. This will materially augment the cleanly appearance of the house, and will be influential in rooting out insects; and, in a general way, may be performed during inclement weather, when very little can be done satisfactorily in the out-door department.

Other operations, such as providing labels, stakes, pegs, trellises for climbing plants in summer, baskets for Orchidaceous plants, canvas screens, and various protecting contrivances, together with the attention demanded by nearly all tender plants to keep them clear of obnoxious insects, will afford ample employment when the weather is unfavourable for other work; and providing these articles now will materially diminish the labours of the summer months.

In the garden this is a proper time for inspecting the drains for conveying away surface water from the walks, &c., and constructing additional ones, wherever they appear needful. Other works adverted to last month, and not yet performed, should be hastened.

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